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NOTICE TO SUBSCRIBERS.

The Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, in issuing the present No. of the Journal from the Press, are again under the necessity of bringing to the notice of its supporters, the obstacles thrown in the way of its regular and periodical appearance, by the difficulty of realizing the out-standing subscriptions. The extremely low price at which it is charged is merely sufficient to cover the expenses of paper and printing, and there is no balance, therefore, to cover any loss arising from delay or defalcation of the stipulated subscriptions.

The cost of the publication of Nos. 32 and 33, was as follows:

Charges on No. 32...... ...	480	4	10
,, ,, 33..........	487	9	7
Total..	967	14	5

of which amount there remain still due from Subscribers for copies delivered,

on account of No. 32 Rs. 268
on account of No. 33 ,, 316

Total.. 584

In addition to which there
still remain due for No. 30 Rs. 66 and for
No. 31 ,, 78

Total.. 144 making the whole amount
due to the Society,........ Rupees 728.

The Funds of the Society are too small to enable the Committee to carry on its usual operations whilst such heavy demands remain out-standing, and it will be out of the power of the Committee to ensure any regularity of publication, or even to continue the work at all, unless a remedy can be found. The Committee have hopes that a plan which they have now to propose, and for which they are indebted to the favorable consideration of the Government, may be attended with success. They are aware that the main difficulty to a prompt liquidation of claims by up-country Subscribers, arises from the trouble of remitting such trifling sums from the interior. They have therefore obtained the sanction of Government for instructions being sent to all Collectors and Paymasters, authorizing them to receive subscriptions on account of the Journal into their Treasuries, and to remit the proceeds quarterly, or half-yearly, by Bills on the Accountant General. In future, therefore, a Bill, exhibiting the amount due, will be transmitted with each number of the Journal to Mofussil Subscribers, who will have nothing more to do than to send the amount due by them to the Collector or Paymaster of the Station at which they may happen to be. Should this measure prove successful, and enable them to advance the necessary funds as required, the Committee pledge themselves to bring out the numbers of the Journal at regular half-yearly, or quarterly, periods according as materials for the purpose may be placed in their hands.

MADRAS JOURNAL

OF

LITERATURE AND SCIENCE.

No. 34. *January—December*, 1848.

I. *Geographical and Statistical Memoir of a Survey of the Neilgherry Mountains, under the Superintendence of Captain* J. Ouchterlony. 1847. [*Communicated by the Chief Secretary to Government.*]

The Neilgherries, properly so called, comprise two distinct tracts of mountainous country, the one called the Neilgherries, or "Neilgherries proper," and the other the "Koondahs." The survey of the latter yet remains to be completed, and hence the statistical data here recorded, relate exclusively to the former region.

Area. The area of the plateau of the Neilgherries, as defined on the north-west, north, east, and south, by the crest of the mass of mountains, and on the south-west by the outline of the "Koondahs," is found by the present survey to comprise 268,494 square acres in its geographical extent: but owing to the ceaseless undulations prevailing over the whole surface, a far greater amount of land is actually available for cultivation.

Of this quantity only 23,772 acres have been brought under cultivation, leaving 244,772 acres either entirely waste, or appropriated for grazing cattle by the various Hill tribes.

Geological structure.

The geological formation of the Neilgherries is of the primitive igneous order; the mass or nucleus of the mountains being granite, frequently passing into sienite.

In every part of the Hills innumerable dykes or channels of basaltic rock, hornblende, quartz, and other minerals commonly found in a similar relation to rocks of the primitive class, intersect the granite, in some instances of considerable magnitude, but more commonly broken into small ramified branches or veins.

In the Koondahs trap rock is more extensively developed, being often found in that part of the district capping the Hills, and spreading out to a considerable extent; but a description of the geology of the Koondahs does not enter into this memoir.

Hornblende rock is also found to occur in some abundance in various parts of the Hills, passing occasionally into hornblende slate, and porphyritic hornblende, having garnets imbedded. This rock is highly ferruginous and decomposes into a stiff red clay which forms extensive beds underlying the soil in many parts of the Hills. It intersects the granite and sienite in deep channels or dykes, which having a greater tendency to decomposition than those rocks, frequently occasion chasms, in which water lodging and wearing away the sides become the cause of the disruption of large masses, which are continually parting from the parent rock, especially after heavy rains.

No stratified rocks make their appearance in any part of this district except at the N. E. angle of the plateau, where, on descending towards the plains, beds of gneiss are met with, but so torn and distorted as to render it almost impossible to derive from their occurrence any geological data of value. The run of the beds however may be pronounced about north and south, the dip being to the east at an angle varying between 30° and 60°. Near the junction with the granite which forms the country in the neighbourhood, the gneiss is much altered, and veins of igneous rock perforate it in all directions.

Gneiss.

I examined this part of the district with much interest, both on account of the highly metalliferous character which this rock usually possesses in other countries, especially as in Saxony its occurrence is marked by the same accompaniments as I have described, and in the faint hope that beds of primary limestone might be found to occur in the vicinity; this mineral, which

Limestone does not occur.

is not found in any part of the mountains, being much needed both for architectural and agricultural purposes.

With the exception of this gneiss formation, the whole of this mountain tract is of primitive igneous structure, granite and sienite alternately appearing as the base of the Hills, while at the same time hornblende rock, basalt, and occasionally greenstone, are found protruding in masses and channels so extensively, as often to give their peculiar character to the rock formation for considerable distances.

Metalliferous deposits.

Ores of copper and lead.

Metalliferous deposits do unquestionably exist in the Neilgherries. Ores of copper (pyrites) and lead (galena) have been found embedded in quartz, but unfortunately not in situ, being merely portions of blocks of stone found in the walls of some "cairns" or ancient places of sepulture, in the neighbourhood of Nunjenaad, not far from the foot of the Koondahs. The circumstance was brought to the notice of Government some time since (I believe by Dr. Burrell and Captain Congreve), when I was directed to co-operate with the latter officer in instituting an inquiry as to the origin of these orey blocks. Captain Congreve however shortly after left the Hills, and though I have taken advantage of every opportunity which offered to pursue the desired object, I am sorry to say my efforts have not been crowned with success, for although many large channels of quartz occur in the neighbourhood of the spot where the blocks were found, and all running in a true metalliferous direction, east and west, I have not been able, though I have traced them a long distance, and crossed their backs in various parts, to detect in any of them a trace of ore, or any of those peculiar indications on the surface, which would elsewhere characterize a vein or lode bearing ores of either copper or lead.

The Todars dwelling near the spot declare their belief that the blocks were brought from the "Koondahs," and although this can be little better than surmise I should certainly say from the aspect of that range of mountains, that deposits of ore are more likely to be found in it than in the Neilgherries. It bears much more the look of a mining country; and the violent igneous action which has evidently prevailed amongst its rocks after their formation, favours the expectation that metalliferous deposits will be found there, if they exist in quantity any where about this mountainous district.

Manganese.

The black oxide of manganese is found about the Hills in many places, existing in small veins and

retiform deposits; but I do not think it could be profitably worked, as the continuance of a supply in a particular spot could not be depended upon, and it could not moreover be brought into any home market, at a sufficiently cheap rate to compete with other ores.

Laterite.

Laterite is also found in various parts of the Neilgherries, generally in an advanced stage of decomposition, forming a lithomargic clay, which underlies the soil of many tracts of land. I observe the existence of laterite most frequently where the sienite contains much hornblende, which favours the belief that it is the result of decomposition of the primitive rock, hastened by the action of the atmosphere upon its excess of ferruginous matter. A bed of this rock occurs near Kaitee sufficiently indurated to be fit for quarrying for building purposes—but no use is made of it by settlers owing to its being more costly than bricks.

Ores of iron.

Ores of iron are met with in many parts of the Neilgherries, occurring in small veins, and disseminated through the mass of the rock enclosing it, but no where (that I have seen) in sufficient quantity to be worth working.

A great many varieties of ores exist, more interesting to the mineralogist than to the statistical recorder.

Hematites.

Hematites, specular iron ore, micaceous iron ore, magnetic iron ore, and iron pyrites, are all found in insignificant specimens.

Pebbles of agate and semi-opal are occasionally to be met with in mountain streams after heavy rain, and would, I doubt not, with corundum, be found more abundant, if persons, who had time to bestow in the pursuit, were to search for them.

There is another mineral which occurs in some abundance on the Neilgherries which might I think—especially in the hands of European settlers—be turned to some economical use.

It is a decomposed feldspar, or " kaolin," of which very tolerable earthenware might be manufactured.

Soil.

The soil of these mountains, speaking of course chiefly of the plateau, is for the most part exceedingly rich and productive, a circumstance for which the observer would not be prepared on witnessing the granitic or sienitic base upon which it rests; since it is usually seen that granitic districts are bleak and barren, owing to the resistance to decomposition offered by the silicious materials of which they consist.

This advantageous contrariety may, perhaps, be accounted for by referring the formation of so much rich soil to the existence of the numerous dykes of rock, whose decomposition is more favourable to its production, especially those of trap and hornblende, the decomposed particles of which, mixing with the quartzose and clayey products of the granite, result in the formation of a soil peculiarly adapted for cultivation.

The great mass of the Hills also has evidently been under grass, and undisturbed by the plough or the mamotie for ages, and as the frosts which occur at the close and beginning of the year in most parts, kill the grass down to the roots, all this decomposed vegetable matter, washed in by the succeeding rains and mixing with the subsoil, continues, and has continued, season after season, to increase its richness, and cause it to penetrate further and further into the poorer subsoil, until the extraordinary depth of rich black mould, which is often observed in the cuttings of a new road, is produced.

The finest patches of land are naturally found on the lower slopes or second steppes, in situations where the conformation of the country has favored the accumulation of soil washed from the hills above, and especially where forests have aided to retain that soil from further denudation by their roots, and have for ages nourished it by their leaves. The chief agricultural tribe on the Hills, the Burghers, seem well aware of this, and the consequence is that in all parts where they cultivate, the face of the country is entirely clear of wood.

Want of Lime.

The chief defect of the soil of this district is the absence of lime, but a very minute quantity of which enters into the composition of the greater part of that under general cultivation at the present time, and as it is too costly an article to be brought up from the plains to be applied as a dressing to the land, considerable deterioration must be going on in its productive capacity. I have remarked that the finest fields are those which are situated near any considerable mass of hornblende rock, and hence it is to be inferred that the superiority of the soil is due to the lime which it receives from its decomposition. Specimens of this hornblende reduced to powder and digested in dilute nitric acid, give a copious precipitate with oxalate of ammonia, showing upon estimate (for I had not the means of collecting and weighing the precipitate), a proportion of at least 8 to 9 per cent. of lime entering into the composition of the rock.

Drained Swamps. The extensive and numerous swamps which occur on the Neilgherries also, when drained, furnish most valuable soil, either for cultivation *per se*, or for top dressing for poor land. But in this latter form it is never used by the Hill cultivators, who are very backward in the knowledge of the uses and properties of particular manures, as will be treated of under an ensuing head, viz., " Modes of cultivation."

Natural aspect. The Neilgherry mountains constitute one of those singular features presented in the physical geography of southern India, of comparatively isolated masses upreared amidst the vast plains which extend over the surface of the country, pointing either to foci or points of ancient volcanic eruption by which they have been formed, or to evidences of the wearing agency which has reduced the surrounding tracts to their present remarkably uniform level state; while mountain masses, forming a core of tougher substance, and of material less prone to decomposition, have resisted the corroding action—and have been thus left in the form of isolated and mural precipices, towering above the surrounding country.

The summit or plateau of these mountains presents a most varied and diversified aspect. Although the land extends over its limits in ceaseless undulations, approaching in no instance to the character of a champagne country, and frequently breaking into lofty ridges and abrupt rocky eminences, it may yet, speaking in general terms, be pronounced smooth and practicable to a degree seldom, indeed I believe, in no instance, observed in any of the mountain tracts of equal elevation which occur in the continent of India.

On all sides the descent to the plains is sudden and abrupt, the average fall from the crest to the general level below, being about 6,000 feet on all sides, save the north, where the base of the mountains rests upon the elevated land of Wynaad and Mysore, which standing between 2 and 3,000 feet above the level of the sea form, as it were, a steppe by which the main fall towards the sea is broken. From both of these elevated tracts the Neilgherries are separated by a broad and extensive valley through which the Moyaar river flows after descending from the Hills by a fall at Neddiwuttum in the north-west angle of the plateau; and the isolation of this mountain territory would be complete, but for a singular sharp and precipitous ridge of granite peaks, which projects out from the base of a remarkable cone called

Yellamullay on the western crest of the range, and, taking a west by north course towards the coast, unites itself with the Hills popularly called the "Western ghauts."

The Koondahs.

In the S. W. angle of the Neilgherries, a singular mass of mountains rises, called the Koondahs, which though in point of fact a portion of the great hilly region, are so completely separated from the "Neilgherries proper" that they merit the distinct appellation they have received. Spurs from this secondary range run to the southward to a considerable extent, almost as far as the Ponany river, and it is in the innumerable vallies bounded by these ridges that the magnificent virgin (forest) land is found, of which I made mention in a former memoir, and which as being eminently well suited for the purposes of coffee and other cultivation, will, I feel convinced, shortly be the means of rendering this district one of the most valuable and important under the Presidency.

Remarkable scarcity of forest.

The Neilgherries, or rather the plateau formed by their summits, are by no means densely wooded, the forests occurring in distinct and singularly isolated patches, in hollows, on slopes, and sometimes on the very apex of a lofty hill, becoming luxuriant and extensive only when they approach the crests of the mountains and run along the valleys into the plains below. This absence of forest in a region in which, from its position between the tropics, from the abundance of moisture, and from the great depth and richness of the soil, the utmost luxuriance in this respect would be looked for, is very remarkable; and leads me to conclude that vast tracts of primeval forest land must have been cleared to make room for cultivation at no very distant period.

This belief is strengthened by the fact, that in all parts of the Hills which are exclusively the resort of Todars, such as the elevated land to the north and west of the Pykara river, the whole of the Koondahs, the north-eastern portion of the plateau, called Kodanaad, and other tracts where no cultivation is at present carried on, extensive forests are found. The principal internal range on the Neilgherries is a lofty mass situated in the heart of the district, and running north-west and south-east, the great mountain called "Dodabetta"—the highest on the plateau (being 8,610 feet above the level of the sea,) being the apex, and from it all the minor ridges and spurs which form the undulating land of the Neilgherries may be said to take their rise, with the exception of the "Koondahs" which have a distinct origin, and of a singular elevated

Dodabetta range.

tract forming the north-west portion of the Hills, which is distinctly connected with the Koondahs by a narrow ridge under Makoorty peak. From the Dodabetta range to the eastern foot of the Koondahs the land falls continuously, when these mountains abruptly rising obtain an elevation very little below that of Dodabetta itself.

Atmosphere and climate.

Owing to the great elevation at which the inhabited summit of the Neilgherries stands, and the consequent rarefaction of its atmosphere, aided doubtless, in some degree, by the beneficial influence of the luxuriant vegetation which clothes them, the district, although distant only 11 degrees from the Equator, enjoys a climate now famed for its great salubrity, and remarkable evenness in its seasons, with a temperature which falls in the coldest month of the year to the freezing point and seldom in the hottest reaches 75° in the shade. In stating this I of course refer to the general circumstances of temperature which prevail, for seasons have of course occurred during which from particular atmospheric causes the mercury may have risen occasionally above this estimate.

Coldest months, December and January.

Hottest months, April and May.

The coldest season is during the months of December and January, and the hottest about April and May, though this latter season is not so certain, depending mainly upon the character and time of setting in of the rainy or S. W. monsoon. The hottest period of the day is about 2 o'clock or 2*h.* 40*m.* P. M., and the extreme range of temperature from sunrise to that time averages most commonly 16° throughout the year. The variation is of course the greatest at the time of frost, viz., January and December, when the extreme radiation which goes on during clear nights produces excessive cold towards sunrise, after which the sun's rays, shining with great fierceness through the rarefied atmosphere, speedily restore heat to the earth, and the temperature of the air rises in proportion. Similar causes, reversed in their action, necessarily produce sudden and great cold after sunset, rendering the climate at this season (and indeed at all seasons more or less) one in which the most healthy residents, and especially those who have recently come under its influence, stand in need of caution in their mode of encountering its vicissitudes. For the reasons alluded to, I would venture to remark, that very early and very late parades, according to the practice of the plains, will be found injurious to European troops located on these Hills, and especially to those men whose constitutions have been worn by long residence in a tropical climate.

Ootacamund 7,300 feet above the level of the sea.

The chief station, Ootacamund, from its superior elevation (7,300 feet above the level of the sea) is more exposed to this unfavourable action than the two minor stations, Coonoor and Kotergherry, which are each 6,000 feet above the level of the sea: although these latter are by no means exempt from the same influence, especially during the cold season, as will be seen by the Tables appended to this memoir.

Choice for invalids of three distinct settlements, enjoying each a different climate.

A very great advantage enjoyed by the Neilgherries as a sanitarium exists in the means which are afforded to an invalid to select the peculiar kind of climate which best suits the malady under which he is suffering—by the existence of three settlements, each under Medical charge, situated in different parts of the range, each having a different aspect, and each a climate peculiar to itself: that of Ootacamund being the coldest—but most damp, Kotergherry the next in the scale, and that of Coonoor the warmest. Thus an invalid whose habits or state of constitution render the change, from the torrid heat of the plains to the penetrating cold of Ootacamund, too great and sudden, has the opportunity and option of acclimatizing himself at either of the minor stations, before exposing himself to the vicissitudes of climate which await him on the highest level.

The Valley of Jakatalla well sheltered.

The climate of the Jakatalla valley which I had occasion to recommend to the Most Noble the Marquis of Tweeddale for the site of the projected barracks for a European Regiment of Infantry, and which has, I believe, been approved of by Government, will I think be found a happy medium between those of the chief and lesser stations. It is well sheltered from the dry cutting northerly winds, which cause so much sickness in Ootacamund during the months of March and April, by the high Dodabetta range which bounds the valley to the northward; and the rains of the S. W. monsoon, though they of course visit this part of the Hills, are by no means so incessant, or accompanied by so much driving mist as is experienced during the same season at Ootacamund. This monsoon (the S. W.) sets in on the Hills during the month of June and is ushered in on the Western side, including Ootacamund, by heavy rain and violent gales of wind. The station of Coonoor gets the monsoon at the same time but with less rigour, owing to the clouds which come charged with rain from the westward being attracted to the earth, and induced to

Enjoys a very even and temperate climate.

discharge their contents by the opposition offered to their flight by the high spurs which run out from the Dodabetta range and interpose between the west and Coonoor.

Kotergherry sheltered and healthy.

The Kotergherry station is also very favourably protected from the violence of the S. W. monsoon by the Dodabetta range itself, which stands out like a huge wall to screen it. The average fall of rain, the chief part of which occurs on the Hills during this monsoon cannot be called excessive, especially when compared with the visitations in this respect experienced in the neighbouring province of Malabar.

The constant shifting of abode from spot to spot, which the duty of conducting a survey necessarily entails, has prevented me from keeping a register of the actual amount which has fallen in every month of the year, except in 1847, but from such observations as have been made when opportunity offered, I am led to believe that about 60 inches is a fair quantity to assign as the average fall of rain throughout one year at Ootacamund, 50 inches at Kotergherry, and 55 inches at Coonoor. The N. E. monsoon sets in generally in the beginning of October, and is often accompanied by rain more or less all over the Hills, but especially on the east side and at Kotergherry, which, from its position, is exposed directly to its force. The month of December is generally very stormy, and often fatal to a large extent to the lives of the Hill cattle, and to the bullocks and other beasts of burthen employed to bring produce from the plains. The cold easterly wind, blowing through the light rain which is continually falling, and striking upon the wetted skins of the animals, produces a degree of intense cold which soon destroys them, and by these means serious inroads are yearly made upon the herds of the Hill inhabitants, by whom their loss is not readily replaced. Annexed to this memoir are various Tables extracted from the Meteorological Register kept in the Survey Office at Ootacamund and Kotergherry, which will show all particulars regarding the changes of temperature, the fluctuations and oscillations of the mercury in the barometer, as shown at the hours of maximum and minimum pressure, (9*h.* 50*m.* A. M. and 4 P. M.) temperature of wet bulb, direction of the wind, aspect of the sky, &c.

Hurricanes very rare on the Neilgherries.

The Neilgherries are occasionally, but by no means frequently, visited by violent storms or hurricanes—so rarely indeed as to excite surprise and speculation

as to the cause of this exemption, when its isolated and exposed situation in the Peninsula is considered. Upon this and other points of interest connected with the meteorology of these Hills much light will doubtless be thrown by the observations now regularly conducted in an observatory recently erected on Dodabetta under the auspices of Mr. Taylor, the Honorable Company's Astronomer at Madras, in which an instrument for measuring the force of the wind, and other valuable adjuncts to a meteorological Observatory have been placed.

During the prevalence of the S. W. monsoon the atmosphere is almost continuously charged, more or less, with dense mist, enveloping chiefly the mountain tops, but descending into the inhabited vallies as the warmth of the day passes, and spreading in heavy and impalpable fog in all directions. When not under this influence the atmosphere overhanging these mountains is brilliantly clear and cloudless—and especially so on the eastern side of the range.

TABLE

Showing the average temperature, &c., throughout the year, on the Neilgherry Hills.

	Month.	Mean Temperature.			* Mean range of the Thermometer.	Rain in Inches.	Remarks.
		At Sunrise.	At 2h. 40m. P. M.	At Sunset.	Sunrise to Sunset.		
		°	°	°	°	"	
At OOTACAMUND, 7,300 Feet above the level of the Sea.	January..	42	63	58	21	1	Cold North-Easterly winds prevail.
	February..	44	65	60	21	1	Do. do. do.
	March....	49	68	63	19	2	Do. and dry do. do.
	April.....	54	68	63	14	5	And dry do. do.
	May	54	68	63	14	6	Commences to vary to S. W.
	June......	53	64	59	10	8	S.W. Monsoon sets in: strong wind.
	July......	52	62	57	10	7	S.W. and W. winds blow.
	August....	52	62	57	10	6	Wind begins to vary to W. & N. W.
	September	52	62	56	10	7	Wind N.W. and towards end N. E.
	October...	51	62	56	10	9	N. E. and Easterly winds prevail.
	November.	49	61	55	12	5	N. E. winds blow, fresh, clear.
	December.	45	60	55	15	3	Do. do. often violently.
					Total.	60	Inches of rain.

* From want of a maximum and minimum Thermometer, I have not been able to record the *extreme* range of the Thermometer during the 24 hours.

	Month.	Mean Temperature.			Mean range of the Thermometer.		Remarks.
		At Sunrise.	At 2h. 40m. P. M.	At Sunset.	Sunrise to Sunset.	Rain in Inches.	
At KOTERGHERRY, 6,100 Feet above the level of the Sea.	January ..	51·5	66	60	15	2	N. E. and N. W. winds prevail.
	February..	52·5	67	63	15	3	Do. do. rain very uncertain.
	March....	54	67	63	13	6	Winds variable N. E. to S. E.
	April.....	56	68	64	12	10	Do. do. N. E. to E. & S. E. rain uncertain.
	May	56·5	68	64	12	2	Do. from N. E. to N. W. & West.
	June......	58	69	65	11	2	Do. from N. W. to S. W. rain var.
	July.......	60	70	65	10	4	S. W. monsoon winds, but light & var.
	August....	60	71	65	11	2	N. W. winds prevail in this month.
	September.	59	69	64	10	2	Do. do. veering to W.
	October...	56	68	63·5	12	10	Do. do. light and variable.
	November.	54	67	61	13	2	N. E. winds veering to N. W.
	December.	52	66	60	14	5	Winds generally from the N. gusty.
					Total.	50	Inches of rain.

Productions.

The resources of this highly favoured region are as diversified and valuable, as they appear easy of attainment, and comparatively inexhaustible. With a climate and soil such as have been described, great productive powers in the vegetable kingdom, and a proportionately high development of them, would naturally be looked for. That the latter is wanting to a lamentable degree is to be accounted for, by the wretched system of husbandry pursued by the agricultural tribes who have settled upon the Neilgherries, as also possibly, in some degree, by the absence of that encouragement which would be produced by the institution of some channel, through which the products of their industry might reach a ready, certain, and ever demanding market.

Wheat.

I commence the long list of productions, which the Neilgherries are capable of supplying, with wheat, as one of the most important, and as one, moreover, which the Honorable Court of Directors appear at the present time to be much interested in collecting data regarding, from all districts in India capable of producing it.

In making up the returns of the gross quantities of grains of all

sorts produced in the district, I have taken the totals of each from the Seebundy accounts of 1847 or fusly 1257, as rendered orally in the cutcherry. From these it appears that in 1847, 70 "vullums" of land were cultivated for wheat, each vullum producing on the average 400 "kolagums." This "kolagum "which is a measure peculiar to the Hill tribes, contains 226 cubic inches, and hence the quantity produced was

3,000 bushels
or 375 quarters

the weight of a kolagum of average wheat (husked) is I find 7lbs. hence the *bushel* of Neilgherry wheat weighs....$68\frac{3}{5}$ lbs. avoirdupois
or a quarter.......$548\frac{4}{5}$,, ,,

A "vullum" of land is equivalent to 2 cawnies, 21 grounds, and 864 square feet. Hence the total quantity of land cultivated for wheat at the present time is, 202 cawnies, or 267 acres: and the produce is $14\frac{7}{10}$ bushels per cawny, or $11\frac{1}{8}$ bushels per acre. The return in moderately good land cultivated for wheat is 40 to 1; or 40 bushels reaped for 1 bushel sown.

That the quantity of wheat at present produced on the Neilgherries could be very greatly increased there cannot be a doubt, provided a better system of husbandry were introduced, and better seed imported from Europe and distributed amongst the agricultural tribes; and as recent distressing circumstances in Great Britain appear to have directed the attention of the Home Government to colonies, which are thought capable of producing this grain in sufficient quantity to assist in relieving the mother country from her present hazardous position of dependence upon foreign states for her supply, I shall venture to offer a few further remarks, before closing my notice of this important item in the chapter of natural productions.

Neilgherries and Koondahs well suited for the growth of wheat.

The whole of this Hill district, including the Koondah mountains, is eminently well suited in point both of soil and climate, for the production of wheat, but as the last mentioned tract is not yet surveyed, it must at present be lost sight of, although I feel confident it will be found on examination to furnish a very important addition to the gross amount of land estimated as suitable for the cultivation treated of, and which at present lies totally waste and useless.

The quantity of land thus lost to the state I calculate to amount to no less than 200,000 acres, as is shown by the following statement :—

			(Square acres.)
Total content of the geographical surface of the Neilgherries			268,494
Of this quantity there are now under cultivation including lands lying fallow......Sq. Acres		31,434	
Pasturage to be reserved for the cattle of the Todars at the exaggerated rate of 200 acres per 100 head (less than 40 per 100 being allowed by the revenue authorities in the calculation for assessment), for an average of 2,000 head of buffaloes will be.......	„	4,000	
Pasturage to be reserved for the cattle of the Burghers, consisting of buffaloes and bullocks, averaging 8,000 head at 100 acres per 100 head	„	8,000	
Land occupied by the cantonment of Ootacamund, future barracks, roads, &c.....	„	6,000	
Village sites, sacred groves, &c...........	„	2,060	
Tracts of rocky ground, morasses, and other land not immediately fit for cultivation (although these might well be considered as compensated by the gain of surface introduced through the undulations of the land)	„	17,000	
		Deduct..	68,494
		and there is a remainder of..	200,000

200,000 Acres of land lying waste on the Neilgherries exclusive of the Koondahs.

acres entirely unoccupied and waste, being either covered with forest, or lying under grass not required for pasturage.

Under a better system of cultivation also it would not be necessary to suffer so large a proportion of the Burghers' cultivated land to lie fallow at one time, as is at present in that condition, amounting, in round numbers, to 17,000 acres out of a total of 31,500 acres of cleared and arable land.

Of the forest land every acre is of course peculiarly well suited for wheat, and being virgin soil it should produce, under proper management, large crops of the very finest grain.

The same may be said of swamps, when drained, but as potatoes are found to thrive well in the soil which their drainage produces, such land in a farm would naturally be reserved for stock produce, and an allowance has therefore been made for this in the estimate.

Making, however, exaggerated deductions on all accounts, there yet remain no less than 200,000 acres of unallotted and unemployed land, of which at the very lowest estimate one half, or 100,000 acres, may be taken as fit for the production of wheat, under a proper system of husbandry, allowing a sufficiency of well prepared manure, an occasional dressing of lime, and exercising proper judgment in allowing it to lie fallow or changing crops, according to its condition and composition of soil.

It has been already stated that the Burghers obtain from their wheat lands a quantity of grain equivalent to $11\frac{1}{8}$ bushels per acre, but as the depth to which they plough their fields never exceeds 7 inches, and for the most part is barely 6, and as they give them only the most meagre allowance of sun-dried and exhausted manure, never exceeding (as far as I have been able to ascertain by counting the baskets brought and measuring spaces of land dressed with it) half a ton per acre, and this not ploughed well into the ground, but merely scraped into the surface furrows, and as they never supply the land with what, from the composition of the soil, it so much needs, viz. lime, it may be safely assumed that under a proper system of tillage this amount of produce could be at least trebled, or, at a very low estimate, 4 quarters of wheat could be obtained from one acre.

I may therefore safely affirm that this district is capable of furnishing, for export to Europe, from 4 to 500,000 quarters of wheat of a quality far superior to that which is at present raised, and at a cost sufficiently low (the distance to the nearest shipping port being only 110 miles, 36 miles of which are performed by water) to admit of large profits being realized by the growers, even when the price in England is so low as 65 shillings a quarter.

The following is an estimate of the cost *to the Burghers* of the cultivation of wheat per English acre, ascertained with as much exactness as circumstances and the deceitful character of the people,

who seldom adhere to the truth in any of their statements, have admitted of:

Estimate.

Estimate of the expense of cultivation of wheat to the Burghers.

		Rs.	a.	p.
Ploughing: 5 ploughs with 2 bullocks and 1 driver, in 3 days plough 1 vullum of land (=$3\frac{4}{5}$ acres). The keep of the bullocks costs nothing, as they get nothing but grazing: the expense is therefore the hire of 15 men per vullum or 4 per acre at 2 annas	Rs.	0	8	0
Collecting weeds and grass and burning them, 2 boys at 1 anna	,,	0	2	0
Bringing and spreading 5 baskets of manure, 1 man at 2 annas	,,	0	2	0
Sowing seed and turning the soil 5 ploughs to one vullum or 6 men, which is $1\frac{1}{2}$ men per acre at 2 annas.	,,	0	3	0
Seed wheat $2\frac{2}{3}$ kolagums at 2 annas and 8 pice per kolagum	,,	0	7	0
Repairing fences and clearing channels to carry off rain, 1 man	,,	0	2	0
Reaping and thrashing: the expense of the first is covered by the straw, and the last costs nothing, as it is performed by the bullocks which are driven round and round a post to tread out the grain.				
Assessment, at the highest rate	,,	0	14	9
Cost per acre	Rs.	3	0	9

Return.

		Rs.	a.	p.
105 kolagums of grain which are sold at 2 annas 8 pice	Rs.	17	8	0
Deduct cost of cultivation	,,	3	0	0
Profit to the cultivator *per acre*	Rs.	14	8	0

It is true that out of this we must take the "goodoo" or tribute which they give to the Todars, and which may be considered in the light of rent for the land; but this is not much; they profess to give $\frac{1}{6}$th, but I have reason to believe, both from the statements of the

Todars and of the Burghers themselves, that what they actually make over as "goodoo" is not above one-half of this proportion, if even so much, especially in the item of wheat which is so profitable to them.

It may not be considered out of place to introduce here a statement of the expense of keeping horses and cattle, and of carrying on farming operations generally on the Neilgherries.

Plough horses.

Horses cast from the Artillery and Cavalry would, when castrated, answer very well for the plough: they may be purchased at from 100 to 200 rupees.

2 horses would require 1 horsekeeper at Rs. 7 per mensem..	Rs.	7
and (until the farm yielded hay)		
2 grass-cutters.................... ,, 4 ,,	,,	8
Food: gram 2 seers per day for each horse 4 × 30 = 120 seers	,,	7
barley 2 ,, ,, ,, 4 × 30 = 120 ,,	,,	4
Shoeing, 1 rupee each per mensem	,,	2
Halters, cumblies, salt, medicines, &c., 1 R. per mensem....	,,	2
Total per mensem..	Rs.	30

which is £ 18 per annum per horse.

Spade husbandry.

A cooly can dig in one working day in new meadow ground about 25 to 30 square yards, one foot deep, his pay being 2 annas.

Children employed to weed, receive 1 anna per day.

Native farm servants, gardeners, &c., receive 5 Rs. a month.

Herdsmen for cows, goats, &c. ,, 4 ,, ,,

Keepers for bullocks, employed to bring supplies or carry produce to the coast or to market, receive 5 Rs. a month, at the rate of 1 keeper to every five head of cattle.

A good carpenter receives ½ rupee a day.

A good bricklayer ,, ½ ,, ,,

Lime.

Lime, in an unslaked caustic state, can be delivered on a farm on an average of distance from the high roads at the rate of 12 annas per bullock load of about 2 bushels.

Bones.

Bones could be obtained from the low country for the cost of collecting in the villages and conveying up the passes.

Barley. Next in importance in the class of productions is barley, the quantity of which, raised during the past year far surpasses that of wheat. In 1847 it amounted to 1,419 vullums, each vullum producing on an average 400 kolagums, making a total of

60,383 bushels,
or 7,548 quarters,

taking the imperial bushel as before at 2,218 cubic inches, and the kolagum, by my measurement, at 226 cubic inches. The barley grown on the Neilgherries is divided into two kinds by the Burghers, the first and best being "Sheemey ganjee" or English barley, so called from its being the degenerate produce of English seed given to the head Burghers many years ago, by, I believe, Mr. Sullivan, when Collector of this district, and the other "Malley ganjee" or Hill barley, which they describe as indigenous to the Hills. The quality of both sorts is very poor, nor is this much to be wondered at when their defective mode of cultivation is witnessed, and the great deterioration of the grain, which naturally results from the constant employment of the same seed in the same land over and over again, without any change or any attempt at the introduction of imported or mixed seed. The weight of a kolagum of ordinary barley is $5\frac{1}{2}$ lbs. which gives 54 lbs. for the weight of a *bushel*, and 432 lbs. for that of a *quarter*. The return in moderately good ground is 50 per cent. under that of wheat, being only 20 measures of crop for 1 measure of seed.

The yield per cawny is 14·7 bushels,
or per acre 11·12 do.

and the total amount of barley cultivation is

in cawnies 4,109
or in acres 5,433

Beer. Before quitting the subject of barley I cannot refrain from adverting to one immediately connected with it, and which I deem of so much importance, that although I am not sanguine in my hopes that Government may be induced by any representation made by me to institute experimental proceedings, with a view to test the feasibility of the scheme, I still consider it my duty to place on record in this memoir the results of experiments which I have had favorable opportunities of making, under the impression that a time must sooner or later come when this,

amongst many other valuable resources of these Hills, will be fully developed and taken advantage of.

I allude to the subject of fermented malt liquors which can be made on the Neilgherries with the greatest facility in all the details of the process, and at a cost so trifling as to enable the commissariat to supply the European troops at the three stations more immediately in the vicinity of the Hills, viz., Bangalore, Trichinopoly and Cannanore, with both ale and porter, at a rate, calculated on an extreme estimate, not exceeding 10 annas per imperial gallon delivered to the men from the cask in the canteen, or 2½ annas per quart, equivalent to 3½*d*. per pot.

Can be made and sold at Bangalore at 2½ annas per quart.

Independent of the importance, both in a moral and economic point of view, of supplying to the troops a liquor which, from its goodness and cheapness, will induce the majority to prefer it to ardent spirits, the subject becomes still more entitled to consideration from the advantages which must result from its successful issue, when the projected measure for the permanent location of a regiment of European troops on the Neilgherries shall be carried out: for as the chief item in the estimate of cost is the carriage from the brewery to the station in the plains, beer will be supplied to those resident on the spot at a greatly diminished rate.

A very favorable opportunity will also be offered for bringing the project into practical operation when a regiment is stationed on the Hills, because amongst the men many brewers and maltsters by trade will no doubt be found, and by the practical knowledge of these men many difficulties in the details of the process which experimentalists like myself encounter, will be speedily overcome. An inspection of the Tables of temperature given in the appendix to this memoir will at once show that the first part of the process of the manufacture of beer, viz., the conversion of barley into malt, can be carried on here as well as in any part of Great Britain; for although the range of the mercury may appear so great as to endanger the success of the process by causing the germination to proceed too rapidly, this evil can be readily averted by placing the malting floors in buildings with thick stone or even mud walls, covered with thatched roofs elevated considerably so as to deflect the rays of the sun and preserve an even and low temperature throughout the day. The temperature found most suitable to malting in England

Malt.

Temperature well suited for malting and fermenting. Average temperature of the Neilgherries 62°.

is about 60° to 62°, and this degree of heat could be maintained without excess in malting sheds on these Hills throughout at least 9 months in the year.

Quality of barley very inferior.

I must observe however that the barley grown here is so poor in quality, so light in the grain, and containing in a given measure so large a proportion of husk in excess of what the same quantity of English barley would produce, that the malt made from it yields in the mash but a very disproportionate quantity of saccharine matter, rendering it necessary to employ raw sugar as an adjunct to produce a wort of sufficient strength. But this, which might elsewhere be considered an objection on the score of expense, is here of easy remedy, since in the immediate vicinity of the Neilgherries, viz., in Mysore, excellent sugar is manufactured in great abundance, and at a rate so low that at this present time, February, 1848, it is being sold in the bazaar of Ootacamund at 3 Rs. 12 annas per maund of 25 lbs. weight, being equivalent to 33*s*. per cwt. Formerly, a prejudice existed against the employment of sugar in the manufacture of beer, but as it is now seen that the permission to introduce it into breweries in England which has been recently granted by the legislature is regarded by the public as a signal boon, it must be self evident that since this important article is, comparatively speaking, indigenous to the spot, cheap, excellent and abundant, and as the climate is in all respects eminently well adapted for carrying on the process of vinous fermentation as well as that of malting, beer and porter can, under proper management, be produced on the Neilgherries in every respect as wholesome and good as that now imported from England, and at a cost less by one-half, even including cartage to the station where it is to be consumed.

Sugar cheap and good.

I beg leave to observe that in advancing these remarks, I do not base my expectations and assurances on mere surmise or theoretical views of the subject, but upon the results of actual experience, as I have now brewed several casks of beer without a single failure in the principal parts of the process, viz., malting, fermentation, and fining, while its quality has been much approved of by many persons who have tasted it, amongst whom I may enumerate, Mr. Drury, the senior member of the Board of Revenue; Captain Bell, Secretary to the Board; Major General Kennett, Lord Gifford, General Gibson, with many others. In consequence of the success which attended my ear-

Good beer has been brewed on the Hills by the writer of this memoir.

ly experiments, in conducting which I employed Malt prepared by myself from Hill barley, with hops and dried yeast imported from England, and my confidence in the success of the scheme if entered into by Government, I addressed a letter to the Commissary General upon the subject, communicating such details as seemed of interest, and offering to carry on further trials on a small scale, at my own expense, if a copper could be supplied to me temporarily on Indent from the commissariat stores. I also sent samples of some beer which I had brewed, but which had an unpleasant taste communicated to it owing to my having employed "gour" or "raw jaggery" in the brewing in place of refined sugar, without taking the precaution of cleansing it from the dirt and gummy matter with which this article is generally contaminated. I was not so fortunate as to receive a reply to this letter (beyond a message through a third party) and this absence of encouragement prevented me from following the matter further, but I may add that for my own use I continued the manufacture with a success, which convinces me that it is only necessary to extend the scale upon which my operations are carried, and to secure practical knowledge in the more important details of the process, to ensure the most complete realization of my anticipations regarding the vast benefits to be derived by this item in the list of productive resources of the Neilgherries.

Samples sent to the Commissary General.

No answer received.

The following is an estimate of the cost of ale brewed here, from *actual* experiment. In England to make a hogshead (66 gallons) of strong ale intended for export to the tropics, the brewers use

6 bushels of malt,
and 6 lbs. of hops:

now it has been ascertained since the introduction of sugar into British breweries that

180 lbs. of moist sugar are equivalent to
1 quarter, or 8 bushels of malt.

Estimate of the expense of manufacturing malt liquors.

If therefore both malt and sugar are employed in equal proportions, the hogshead will require 3 bushels of malt and 72 lbs. of sugar. Considering the Hill malt to be 100 per cent. inferior to English malt, I made use of

6 bushels of malt and 72 lbs. of sugar.

ESTIMATE.

6 bushels of barley, or 60 kolagums at 12 kolagums per rupee,	Rs.	5	0	0
72 lbs. (3 maunds) of sugar, at 4 rupees per maund,	,,	12	0	0
7 lbs. of hops, imported from England,	,,	7	0	0
Fuel for kiln drying malt, and boiling,	,,	1	4	0
Proportion of labour in steeping barley, turning malt, drawing water, brewing, &c.	,,	2	0	0
Sundries,	,,	1	4	0
Cartage to Bangalore (1 cask a load,)	,,	9	0	0
Total Rupees		37	8	0

A hogshead should run 60 gallons of clear beer, hence Rs. $\frac{37,,8}{60}$ = 10 annas per imperial gallon for the gross cost.

This estimate might be reduced in many of its items if a Government brewery were established here upon an extended scale. In the first place all the yeast produced would meet with a ready sale in Ootacamund, for the bakeries which are now dependent on the low country for a supply of toddy, with which bread is fermented all over India, and which, having to travel a considerable distance before it reaches the settlement, is often found to have passed into the stage of acetous fermentation, rendering it either unfit to make bread with, or causing the bread to have an unwholesome and bad taste. A large quantity of yeast would also be daily required for the bakehouses of the European regiment located here. The estimate for hops, at 1 Rupee per pound delivered here, is far too high, as, if sent out by the Home Government in quantity, they could not possibly stand in at the brewery at so high a rate; and the cost of labour would be diminished if a large quantity of beer were brewed daily.

Yeast much wanted on the Hills for making bread.

I would further beg leave to dwell upon the importance to this district of the establishment of such a manufacture upon a large scale in a Revenue point of view, which from the great demand it would create for barley, would soon lead to the reclamation of the greater part of the waste but rich lands, which are now left untouched through want of stimulus to the industry of the Hill

The Revenue improved by the increased demand for barley for malting.

tribes, and also, as it appears to me, in some measure to the want of hands to till them—a deficiency which would however be speedily remedied by immigration from Mysore and the plains around. In fact were it not for the assumption of absolute right over all the lands, waste and cultivated, which are situated on the plateau of these Hills, by the Todars, Burghers, and Kothers, there is no doubt that many low country people, who came up here seeking employment as Coolies, would form settlements and permanently locate themselves wherever they could obtain possession of land to bring under cultivation. Should Government at any future time see fit to create an establishment on these Hills for the manufacture of beer, it would be very advisable, and indeed in the first instance almost indispensable, to connect with it a Government farm, to serve as a model for the introduction of improvements in husbandry, both in regard to ploughing and dressing the land, and in the preparation of good manure, a department of the farmer's profession of which the Hill agriculturists appear to have no knowledge whatever. Good seed must be sent from England and distributed amongst the Burghers, upon whose exertions the stimulus of a premium, in the shape of a higher price for barley of a superior description, would doubtless soon produce a beneficial effect, while imitation of the system pursued by the employés of Government in the management of the farm lands would also, it is supposed, lead to the adoption of more civilized notions and practice of agriculture than are now to be found prevailing in any part of this rich, but ill appreciated, Hill tract. In this climate Europeans might with perfect safety as regards their health, go through all the out of doors labour which falls to the lot of farming men in England. They do so in New Zealand and Port Adelaide where the climate is unquestionably less temperate than here, and as on the Neilgherries the actual exertion of European bodily strength would only be required at particular seasons of the farming year, such as in the direction of the plough and the use of the scythe, while superintendence and instruction of the Native labourers would alone be required, on the part of a European, in conducting the minor details of a farm, I cannot but think that in many respects a far finer field is offered on these Hills to the emigrant farmer from home, than is met with by the many who flock to the Australian settlements.

Advisability of establishing a Government farm, for the purpose of promoting and improving the cultivation of wheat and barley.

Europeans can labour in the day time on the Neilgherries.

Labour cheap—2 Annas per day.

Here cooly labour is very cheap, 2 annas or $2\frac{3}{4}d.$ a day being the regular rate of pay for a working man who can perform any duty pertaining to spade husbandry, and undertake all the duties of a farm, which, in England, fall to the lot of the common labourer, such as hedging and ditching, trenching, hoeing, reaping, stacking, thatching, &c. &c. A shilling a day, or $\frac{1}{2}$ a rupee, is the pay of a bricklayer or carpenter; men to look after 2 horses receive 14 shillings, or 7 rupees a month, cowherds 4 or 5 shillings, and all other labour in proportion. These advantages, coupled with those presented by a ready and ever demanding market for such articles of produce as wheat, barley, (oats if raised) clover, hay (of which article an immense quantity would be consumed in Ootacamund if it was procurable), turnips, potatoes (Ceylon offering a very favourable market for this vegetable), butter, eggs and stock of all descriptions, both for butcher's meat and for salting for ship use, would surely, it is to be supposed, tempt many indigent farmers to this hilly region, whose necessities impel them to emigrate from the mother country, but whose steps are stayed by the warnings uttered by the many hundreds of their unfortunate fellow countrymen, who have hurried heedlessly out to the Australian colonies, only to meet with disappointment and ruin.

Should circumstances ever induce Government to establish a Farm on these Hills for the purpose of encouraging the growth and extending the cultivation of wheat and barley, I should recommend two sites for its location; one on the elevated tract of land to the westward of the Pykara river, commencing at the north-west angle of the plateau near Neddiwuttum, and extending southward to "Makoorty peak," the whole of which may be said to be uninhabited, there being only 7 small Todar munds situated in it, and these not all occupied, while the soil is for the most part excellent, pasturage abundant, and the land covered, in many parts, with fine forest, rendering the tract (which contains about 12,000 acres) admirably adapted for the purpose which I venture to suggest.

Site recommended for a Government Farm.

The other site is a fine tract of land forming a sort of promontory in the north-east angle of the plateau of the Hills called "Kodenaad" which is equally uninhabited, having only 3 occupied Todar munds within its limits; the

Kodenaad.

soil good and forest abundant, many fine wooded vallies extending through it, and offering a most eligible locality for a farm. The tract contains about 7,000 acres.

Other dry grains produced.

The other grain productions of the Neilgherries are ragghee, samee, korallie, tenney, buttacudaley (a kind of peas), shanungee (a kind of gram), garlic, onions, kudagoo (mustard seed), vendium, opium and potatoes. Almost all the grains enumerated are raised solely for home consumption—and, excepting korallie, for which about 1,200 vellums of land are cultivated yearly, the quantity of each which is produced is insignificant.

I may therefore refer for further particulars regarding them to the accompanying "Statement" in which is set forth the total quantities of land cultivated and of grains produced, the ratio of return of crop to the seed sown, the selling prices of each and the rates of assessment. The information upon which the table has been formed is derived from the revenue accounts for 1847, and although the average of produce and return is rather a high than a low one, it may, I think, generally speaking, be pronounced as correct as it is possible to make a return of its description, in a district where the site of cultivation is so perpetually shifting as is the case on the Neilgherry Hills. From the data given in the statement it will be apparent that, where the cost of labour is so low as it is here, considerable profits must be realized by the cultivators.

In the items of potatoes, wheat, poppy and barley we find that after deducting the assessment and the cost of seed there remains respectively as profit, and for repayment of the expense of cultivation:

Profit per acre to the growers on Potatoes, Wheat, Poppy, Barley.

On one acre of Potato land....	Rs.	54	3	3
,, ,, ,, ,, Wheat ,, ...	,,	16	0	0
,, ,, ,, ,, Poppy ,, ...	,,	8	10	0
,, ,, ,, ,, Barley ,, ...	,,	5	13	7

These are estimated upon the prices obtainable on the Hills for produce, but if potatoes and wheat were exported a much larger profit would be realized. Hence another promising opening to emigrants in the form of an establishment for breeding and salting pork for ship use; as, since potatoes and barley can be produced at so low a rate, and a herd of

Salting pork, &c.

STATEMENT of the AGRICULTURAL PRODUCTS of the NEILGHERRIES in 1847—Fusly 1256.

Name of Production.	Quantity of land cultivated.			Produce.		Ratio of return of crop from seed.	Gross amount produced.			Average selling price.									Rate of Assessment.																	
		Equivalent						Equivalent					Equivalent						For good land.									For inferior land.								
																						Equivalent									Equivalent					
	In Vullums.	In Cawnies.	In Acres.	In Kolagums per vullum.	Equivalent in bushels per acre.		In Kolagums.	In bushels.	In quarters.	Per Kolagum of 2 seers.			Per bushel.			Per quarter.			Per Vullum.			Per Cawny.			Per Acre.			Per Vullum.			Per Cawny.			Per Acre.		
										R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.
Wheat........	70	202	267	400	11·12	40 to 1	28,000	2,978	372	0	2	8	1	9	0	12	8	0	3	8	5	1	3	6	0	14	9	2	5	7	0	12	9	0	9	10
Barley........	1419	4109	5433	400	11·12	20 ,, 1	567,600	60,383	7548	0	1	1	0	10	2	5	1	4	3	8	5	1	3	6	0	14	9	2	5	7	0	12	9	0	9	10
Raggee.......	105	303	400	400	11·12	80 ,, 1	42,000	4,468	558	not brought to market.									2	0	11	0	11	5	0	8	8	0	14	1	0	4	10	0	3	8
Samee........	364	1052	1391	300	8·4	60 ,, 1	109,200	11,617	1452	0	0	0	0	0	0	0	0	0	2	0	11	0	11	5	0	8	8	0	14	1	0	4	10	0	3	8
Koralley......	1289	3724	4924	200	5·6	10 ,, 1	257,800	27,425	3425	0	0	0	0	0	0	0	0	0	2	0	11	0	11	5	0	8	8	0	14	1	0	4	10	0	3	8
Tenney.......	102	294	385	300	8·4	30 ,, 1	30,600	3,255	407	0	0	0	0	0	0	0	0	0	2	0	11	0	11	5	0	8	8	0	14	1	0	4	10	0	3	8
Buttacudaley.	83	240	317	200	5·5	40 ,, 1	16,6 00	1,766	221	0	2	8	1	9	0	12	8	0	2	0	11	0	11	5	0	8	8	0	14	1	0	4	10	0	3	8
Shanungee....	55	159	210	300	8·4	30 ,, 1	16,500	1,755	220	0	2	8	1	9	0	12	8	0	2	0	11	0	11	5	0	8	8	0	14	1	0	4	10	0	3	8
Garlic........	132	381	504	600	16·8	48 ,, 1	79,200	8,425	1053	0	0	10	0	8	0	4	0	0	3	8	5	1	3	6	0	8	8	2	14	7	0	12	9	0	9	10
Onions.	31	90	141	700	20·	56 ,, 1	21,700	2,308	288	0	1	1	0	10	2	5	1	4	3	8	5	1	3	6	0	14	9	2	5	7	0	12	9	0	9	10
Mustard Seed	122	352	491	300	8·4	150 ,, 1	36,600	3,893	487	0	0	10	0	8	0	4	0	0	3	8	5	1	3	6	0	14	9	2	5	7	0	12	9	9	9	10
Vendium.....	67	194	256	200	5·6	100 ,, 1	13,400	1,425	178	0	1	0	0	9	5	4	11	4	3	8	5	1	3	6	0	14	9	2	5	7	0	12	9	9	9	10
Poppy Seed }	93	269	353	100	2·8	100 ,, 1	9,300	990	124	0	4	0	2	5	7	0	0	0	3	8	5	1	3	6	0	14	9	2	5	7	0	12	9	9	9	10
and Opium }				2 3/5 lbs. per Vullum.		,,	242 lbs. Avoirdupois.			3	0	0	per Seer=Rs. 5 per lb.						included with the seed in the Assessment.																	
Potatoes......	49	141	186	600 Mds. ,,		15 ,, 1	29,400 Mds.=cwt. 6562			0	6	0	per Maund=R. 1 ,, 11 per lb.																							
	3981	11,510	15,220	Acres of land under cultivation.															7	0	0	2	6	9	1	13	4	5	0	0	1	11	8	1	5	0

cows kept for nothing but 5 shillings a month for a herdsman, with a per centage to cover interest on outlay and casualties, it cannot be doubted that the meat cured in this climate would both prove of excellent quality, and return, by its sale at Bombay or other shipping ports, a considerable profit to the breeder and salter. Under any circumstances larger profits must be realized than those returned from the same market to the exporter from Europe, who has to breed his stock under all the disadvantages of dear food and labour, and cost of freight to its destined port of sale.

Hides.

Amongst the productions of the Neilgherries may be enumerated hides, both of the buffalo and ox, the former of which are especially prized in the low country for making soles of shoes, traces and other articles requiring a strong and durable leather. The hide of the bull buffalo is considered far superior in value to that of the cow. I have not been able to ascertain what quantity of hides are annually collected and cured here for export, but it cannot at present be very considerable, as it will be seen by the returns in the appendix that the total number of buffaloes and bullocks herded on these Hills is, comparatively speaking, by no means large.

Opium.

Opium is produced on the Neilgherries to a small extent, and it appears that the Burghers who cultivate the poppy pay more attention to the collection of the seed (which fetches a very remunerative price as an article of food in the bazaars) than to the extraction of the drug from the capsules of the plant. The total quantity produced last year was under 200 lbs. avoirdupois, but I have no doubt it could be increased very greatly if other cultivators could be introduced on the Hills; as the Burghers, slaves to habit, prejudice, and the love of ease, oppose themselves to any change or improvement which involves additional trouble or personal labour.

Poppy fields require some care both in preparing and well manuring the ground before sowing, and in hoeing and irrigating it whilst the plants are young. Hence this kind of cultivation is only carried on in the immediate vicinity of their villages, where the fields can be attended to by the women and children, and where manure, such as it is, is more readily, and with less trouble, collected.

Neilgherry opium of very fine quality.

The opium extracted by the Burghers from their poppies appears to be of exceedingly fine

quality, and meets with a ready sale in the bazaars of Ootacamund amongst the Mysore and Malabar coolies and others in better circumstances, by whom it is eaten in its raw state, but never, as far as I can learn, smoked.

Having thus reviewed the more important articles of agricultural produce, I am induced, before concluding the subject, to hazard the remark, that I cannot but consider that the lands comprising the plateau of these Hills, so valuable from their capacity for producing grains which cannot be cultivated in the low country which surrounds them, and which are so much needed for the public good, are, under the exclusive system which at present prevails, both misappropriated in their partial cultivation, and wastefully neglected, inasmuch as that there is not drawn from them that full amount of benefit to the community, which nature has so eminently qualified them to contribute.

The Neilgherries misappropriated and neglected.

On looking at the "Statement of productive resources" it will be seen that out of 11,500 cawnies at present under actual cultivation, only 4,300 cawnies are devoted to the production of wheat and barley, while on all the rest of the land grains are reared, which, with only one or two exceptions, are grown just as well, and far cheaper, in the plains below, and would be brought up and bartered for wheat to any extent, could this much wanted grain be procured on the Hills in greater quantity. It will scarcely be credited that this district so peculiarly well adapted for the cultivation of wheat actually does not produce enough to supply the bakeries of the principal settlement, for the use of which large quantities of a very inferior description of grain are imported from Mysore; while the minor settlements of Coonoor and Kotergherry are supplied with bread from Coimbatore.

Hill wheat certainly finds its way to the low country, by being bartered by the Burghers with the traders for cloths and other articles, but the quantity thus exported is insignificant, and bears no comparison with that imported from Mysore.

Silk.

There remain yet a few articles of plantation produce to be noticed, the oldest of which, in the agricultural history of the Neilgherries, is silk. There are several plantations of mulberry trees in various parts of the Hills, for the breeding of the silk worm, with establishments for preparing and

winding the cocoons, the silk produced by which has, I understand, been pronounced in London to be of a quality very far superior to any produced in the plains, either in Bengal or other parts of India; and what has been sent to England appears to have realized very high prices. The quantity produced however has hitherto been very insignificant, and I confess, as far as I am able to judge, the scheme appears a complete failure. The mulberry trees do not shoot out fresh leaves with that redundant luxuriance which distinguishes all other descriptions of vegetation on these Hills; the weeding, watering, and pruning which they require involves much expense; the worms require the most delicate treatment, both in regard to food and temperature, any mismanagement of which entails destruction on myriads, and the quantity of cocoons produced is not in a sufficiently large proportion to allow the superior quality of the silk reeled from them to secure a profit to the planter.

Already one extensive plantation, and worm and silk house, at Coonoor, has been given up; and I should think it will not be found that this description of cultivation will be extended by future settlers.

Coffee.

Numerous plantations of coffee trees are scattered about the Hills, principally situated on the slopes descending to the plains, where the elevation suitable for the growth of this shrub can be obtained. Until within the last two or three years, coffee plantations were only found on the eastern side of the Hills, but representations of the excellent quality of the berry, and of the advantages attending its cultivation on the Neilgherries, having been made in Ceylon, the attention of the skilful planters of that island was attracted in this direction, and the result has been the opening of several plantations, where I ventured to predict, in a former memoir, that this description of cultivation would sooner or later be introduced, viz., on the western slopes of the Hills, where advantages are offered to the planter eminently superior to those, the possession of which has, of late years, so greatly enhanced the value and importance of the neighbouring island.

Cheap labour, 4 Rupees a month.

The chief of all is the cheapness of labour, a cooly receiving even on distant plantations in the "Koondahs" 4 rupees a month, while in Ceylon 8, 9 and even 10 are given; while in the pay of artizans such as carpenters, sawyers, masons, &c., a still greater disparity exists in favor of this district.

Second to this is the abundance of labour which can always be commanded here, the neighbouring provinces of Malabar, Mysore, and Coimbatore supplying coolies in sufficient numbers to meet all demands, and at all seasons of the year ; while in Ceylon the utmost difficulty is experienced in most parts to obtain labourers when urgently required ; and at all times the supply of coolies is extremely precarious. Planters here have also the advantage of a good public road passing through the heart of the forest land of the "Koondahs," and affording ready means for obtaining supplies, machinery, &c., or of sending away produce for shipment by a route, of which less than 30 miles are by land and 36 by water, to the port of Calicut. One estate which was opened about 2 years ago near "Wallahkadoo," half way down the Koondah ghaut, by the late Archdeacon of Ceylon and Mr. Hutson, also of that island, and which I had an opportunity of inspecting recently, on my way up from the western coast, is in a very flourishing condition, and has every promise of turning out most successfully. In its neighbourhood are tracts of virgin forest land of immense extent, stretching away over the innumerable spurs and vallies into which the Koondahs are broken as they slope downwards towards the Ponany river, all eminently suitable for coffee planting, having the proper elevation, a good and rich soil, and enjoying a climate particularly favorable to the nourishment of this peculiar shrub. If the success which is looked for crowns the exertions and adventure of the first speculators, there can be little doubt that when the Koondah coffee appears regularly in the market as a production of this district, the attention of capitalists at home will be directed to it, and the western portion of this mountain tract become a source of great increase to the revenue of the country, while it will afford employment and subsistence to the many indigent people in the neighbouring provinces, who, at the present time, suffer such privations from the want of it, between the seasons of sowing and reaping the crops in the plains, and indeed for more than three quarters of the year.

Western slopes of the Koondahs well suited for coffee cultivation.

The other, or what may be called the old plantations in the other parts of the Hills, but principally on the north-eastern slopes, are insignificant in point of size, but remarkable for the peculiarly fine flavour of the coffee produced, which is considered to be owing to the high elevation at which most of them are situated. Some plantations

Plantations at Coonoor and Kotergherry too high.

near Coonoor and Kotergherry are 5,000 feet above the level of the sea, but it seems to me that the advantage derived from this superiority of flavour is more than counterbalanced by the general want of vigour and luxuriance of the coffee trees, which evidently do not thrive in this latitude so well at an elevation above 4,500 feet, as between that and 3,000 feet. It is not easy to estimate the amount of land at present under actual cultivation for coffee on the Neilgherries, as, in most cases, the coffee fields are so mixed up with the mulberry grounds, that it is difficult to arrive at the precise extent of each, but it may be pronounced not to exceed 280 acres on the eastern side, and 300 acres on the western. The general return of those on the eastern side, which are the only ones at present in bearing, is on an average about 6 to 7 cwt. per acre; which is a remunerative rate under the prevailing circumstances of cheap labour, but the trees require manure to keep them up to this rate of bearing, and more care in pruning and managing than is bestowed upon them.

Salt Provisions.

Salt provisions may be mentioned as an article of produce of the Neilgherries, though the preparation of them is not carried on in an extensive way. Hams, bacon, salt pork, &c., are cured in the settlements and sold at a cheap rate: some cured by European settlers being of excellent quality. I am informed that the Bombay government were anxious sometime since to enter into a contract for the supply of the Indian Navy with salt provisions, in lieu of those prepared for government use in the unsuitable climate of Bombay; but the opportunity of establishing this branch of productive industry on a firm and regular footing was lost, owing to there being no person on the Hills who could be induced to undertake the responsibility of so extensive an engagement.

Stock for salting could be fed economically.

The feeding of stock, if connected with a proper farm on which to raise dry food and support cattle, could be carried on most economically here, especially as regards pigs whose chief food, potatoes, is raised on the Hills out of almost any soil and with a most profitable return. There might be more difficulty in fattening oxen for the salting tub because the pasturage on these Hills, though for the most part luxuriant is rank and fibrous, and does not appear to produce fat or flesh in ruminating animals, except in the case of the Hill buffaloe which alone thrives upon it; but as mangel wurzel has been tried and seems to take very kindly to the climate and soil, this difficulty might be overcome by its introduction. A good English grazier also would soon

exterminate the bad grass out of his land, and replace it by grass from good mixed seed from home, which experience (on a small scale) has shown to thrive well on these Hills. Clover and lucerne also flourish here, especially on lands not more than 6,000 feet elevated above the level of the sea—in fact under a proper system there never could be any want of dry as well as green food for fattening stock, felt in this district.

Fuel likely to become scarce on the Hills.

There is another subject which before closing this chapter I am anxious to draw attention to, and that is the supply of firewood obtained from the woods with which the surface of the Hills is dotted. This may at a casual glance appear comparatively inexhaustible, but I am satisfied it is not so, and that to preserve in localities, where it may be called available for general use, a provision for future years, some measures of conservation should be adopted; more especially should European troops with the host of Natives who will follow them, be permanently located on the Neilgherries. At present, while hundreds of trees are being felled daily, not one is planted, and it is reasonable to anticipate, that unless some system is adopted to conserve and renew the woods, particularly in the neighbourhood of the projected barracks, government will before long be put to a heavy expense in supplying the troops with this necessary of life from a distance.

Modes of cultivation.

The modes of cultivation adopted by the agricultural Hill tribes have been, already, so frequently adverted to in the preceding chapter on productions, that it will be only necessary here briefly to review them. I have described their system of agriculture as radically bad: and it is so for these reasons; first, because the land is not properly ploughed; secondly, because it is not properly manured and dressed; and thirdly, because no change is ever made in the seed which they sow in it; not even to the extent of bringing it from neighbouring villages, the Burghers sowing the same seed over and over again in the same soil, until an inevitable deterioration takes place in the product.

Ploughs very bad.

The plough used is a most wretched implement, the share being almost invariably a piece of pointed wood, of a tough description, hardened in the fire, and not shod with iron, or any other metal. Owing to this, and to the clumsy form of the plough, which gives the man at the tail but little power over the instrument, the land is not furrowed or turned up beyond a

depth of 6 inches, and consequently fresh and unworked soil is never worked up to the surface, but the top soil is alone made use of. The consequence of this, and other causes, is that they can take but one crop off their lands, of wheat and barley, and are then compelled to let them lie fallow always for two, and generally for three years before they are again brought under the plough. Attempts were, I believe, made some time back to introduce cast iron ploughs amongst the Burghers, but, of course, without success; first, because of the obstruction which their prejudices opposed to the introduction of the novelty; and secondly, because there were no Europeans to show them how to use them, or how to team their little diminutive cattle so as to enable them to drag them. It would be useless therefore to attempt to make them use a better description of plough, until the means for instructing them in its use could be commanded; and here again we see the advantages which a model government farm would present, in the facility with which all such innovations upon their old vicious system could be practically illustrated, and made available for those, for whose improvement it was introduced. At present, instead of making one plough perform the work of furrowing the ground to the required depth, six or seven ploughs are employed, each following precisely in the track of its predecessor, the spike of the one deepening the small trenches scraped by the other; until, when the last has passed, it has been made what they consider deep enough, when they turn and form a new one. The ground is then worked, chiefly by boys and women, with a small hand hoe (for they have no harrows or any other farming implement besides the plough), and the grass and weeds collected with the hand into small heaps, and afterwards burned. Manure is then thrown over the fields and slightly worked in, and it is then considered fit for the seed. The wretched quality of the manure which they use, next requires notice.

Neglect of manure.

They have no knowledge whatever of the way to produce or manufacture, if the term may be used, manure, by heaping the dung of their cattle, and covering it in with alternate layers of soil, and vegetable substances; but merely take the dung, which has been lying exposed to the sun and weather for months, the whole of the nutritious gases having escaped and its fermentation being long since over, and apply it in its dry and hard, and all but useless state, to the land.

The consequence of course is, that the soil derives but little or no benefit from the manuring, no heat is communicated to it to encourage the seeds to germinate, or to stimulate and invigorate the growth of the young plant, and the grain produced is small, light, and poor. There is no doubt, as I have already remarked, that lime is the manure most needed to improve the general soil of the Neilgherries, but the expense of this material of course deters the native cultivators, whose ideas cannot be carried beyond the prospects and returns of the current year, from using it. But this expense, under a proper system of farming, would be found light, as in all probability about 40 bullock loads, or 2 tons of lime per acre, applied once in 5 years, would be found sufficient to produce a very great and remunerative improvement in the crops raised.

Lime dressing for the soil.

Expense 25 Rs. per acre, once in 5 years.

This quantity would cost, for lands situated within 2 or 3 miles of any of the passes or ghauts, about 25 rupees, and as the lime burners are always glad to receive Hill produce in barter for their commodity for the sake of keeping their cattle employed, the cultivators would not be called upon to find capital to invest in this part of their farming operations.

Preparation of manure.

A most essential point on which the Hill cultivators stand in great need of instruction is—the preparation of manure, for which the climate, with its sharp sun heat in the day, and its cold dewy nights, so favorable to the promotion of decomposition, and the abundance of vegetable matter rich in alkali, such as the fern, which is to be found all over the Hills, affords great facilities. Every Burgher and Kother village has a large herd of cattle attached to it, which are penned during the night in a large circular pen surrounded with stone walls, and allowed to graze over the country during the day. They are never littered at night, and their ordure is allowed to accumulate and lie exposed to the sun in the pen, until it becomes an inconvenience to the cattle, when it is removed and thrown outside, and left, as before, uncovered and exposed to waste away. Now if a few trusses of fern were to be strewed occasionally over the pen, and all the collections, down to the scrapings of the soil, removed frequently and laid in layers with soil, weeds, fern or other green vegetable matter alternately, the nutritive gases of the dung would be retained, the decomposition of the mass

would proceed by slow fermentation, and by continually adding to the heap or forming new ones, every village would have ready for use at the time of sowing, which is as soon as the frosts have ceased, a large stock of the very best and richest manure, instead of the small quantity of almost useless stuff which they now employ. I believe it has been ascertained in England that this system of covering in the layers of manure with soil, adds 50 per cent. to its value, both because the gaseous matter is retained thereby, and because, by its action, the earth laid on becomes impregnated with ammoniacal and other salts, and forms an adjunct to the dung when worked up with it. It is not therefore too much to say that by the introduction of a better system of preparing manure, or rather by the introduction of a system where none now prevails, the produce of the lands cultivated by the Hill tribes would be increased by 50 to 100 per cent., and it would moreover enable them to bring more land under the plough, and avert the necessity which they find, or consider to exist, for allowing their corn lands to lie fallow 2 or 3 years for 1 year of crop. Indolence combined with apathy, is, however, the prime cause of their deficient system of agriculture; for, I firmly believe, that were fine manure heaps prepared in this way for their use, they would, avaricious as they are, prefer letting a field, capable, if sufficient manure were applied, of producing a crop of wheat, remain fallow through the year, to carrying the manure to it if it lay at the distance of a mile or so off.

No carts employed on farms.

They never use carts to carry manure to their fields or to bring produce home, every thing being carried on their heads, although, in many parts of the Hills, the features of the ground would admit of the light bandy of the country being employed very advantageously. Such an innovation would however never be dreamed of. Thus it is that this fine district, capable of being turned to such great account, is perverted in its use, and undeveloped in its resources: grains, which can be produced in almost any soil and in the sultry climate of the plains, raised on its lands because they require no manure, or but little, to nourish them, and because their culture, and future management involve no great labour or trouble to the holders of the soil. A striking contrast in respect of agricultural industry, and a desire to improve, is presented by the system pursued by the emigrant natives from the

Native emigrants from the plains more industrious than the Burghers.

plains, who have settled in various parts of the Hills, principally in the vicinity of the European stations, and employ themselves in cultivating small patches of land for potatoes, turnips and other European vegetables. These men having had the value of the soil pointed out to them, are now commencing in various parts to drain and reclaim the bog lands, and raise upon them crops of the very finest Potatoes, with a very small outlay. Their enterprize is however circumscribed by the absence of an extensive demand, and by the want of dealers who might buy up the surplus stock in the settlements, and send the commodity either to Ceylon, where a highly remunerative market would be found, or to the several large stations in the plains where the demand is always active.

Wheat, barley, &c., sown in April and reaped in July and August.

Wheat, barley, and most of the other kinds of grain produced on these Hills are sown generally in April, when the frosty weather has entirely passed away, and the crops are cut if the season has been favourable in July. Poppy seed however is sown in October, and the drug collected in January, as it is found that the opium exudes more freely, and of greater consistency and richness, in frosty than in warm weather. For potatoes no particular time is observed, the sets being put in the ground in any month, except the most frosty ones of December and January, and as soon as one crop is taken up, which is in three months from the time of setting, the land is manured, dug and hoed, and fresh sets put in without any delay, so as to ensure three full crops during the twelve months.

Three crops of potatoes raised annually from the same land.

Prices of principal products.

The prices of all the grains produced on these Hills have been already given in the table at page 26; it is therefore only necessary here to particularize those productions which have not found a place in that return.

Coffee.—The average price of coffee in the bazar is 5 rupees per maund of 25 lbs: but it fluctuates much, being at the present moment not more than 4 rupees a maund, owing to the anxiety of growers to get rid of their crops picked in November and December on the spot, to avoid the expense and risk of sending them to Madras or to the western coast for shipment.

Silk.—For this article there is no sale on the Neilgherries.

Hides.—These are to be obtained, but in limited quantities—Buffalo hides are sold at 2 rupees each and ox hides at 9 annas.

Building Materials.—(At Ootacamund) bricks per 1000, rupees 2; tiles per ditto, rupees 1 12; teakwood and chunam are brought, the one from Seegoor and the other from the province of Coimbatoor.

Salt Provisions.—Hams are sold at 5 annas per lb.; bacon at 4 annas per lb.

Butter.—Fresh, 1 rupee per pound.

Jungle-wood.—The best description is the "Bastard cedar" which is now extensively used for flooring planks and doors, shelves, &c., in house building. The price is about 7 annas per 12 square feet of one inch thick. Rafters, lintels, beams, &c., in proportion.

Bees Wax.—Unbleached, is sold by the Erulars and Coorumbers at ¼ rupee per seer.

Castor Oil.—Of very excellent quality is expressed here, and is sold at 3 annas per quart bottle, or about 1 rupee per imperial gallon.

The prices of these articles of course differ at each of the three settlements, but the difference is slight and not worth recording in this statement.

Tenure and occupation.

Land is held on the Neilgherries by European settlers, under a putteum or grant from Government leasing it to them in perpetuity, so long as the regulated assessment is paid. In the cantonment of Ootacamund grants are made of the land without any fee being exacted, but beyond its limits, as every spot, whether utterly barren and incapable of production, or only untilled waste, is laid claim to by either the Todars, the Burghers, or the Kothers, the land has to be purchased from one or other of these tribes, who exact such price as they think fit. After such purchase has been effected it is necessary to apply to the Collector of the district for a putteum, or acknowledgment of right to occupy and cultivate, though this may be considered a matter of mere form. The tenure of land by the various Hill tribes will be more fully entered on in describing each separate race of people; it will therefore only be necessary to record here, for the sake of reference, the general circumstances which rule it.

Tenure of the Todars.

Todars hold their land, which they consider to extend over the whole plateau, by right of immemorial occupation, alleging that their ancestors came to the Neilgherries before there were any kings or sovereign rulers in southern India, and never paid tax or tribute to any one.

Tenure of the Burghers.

The Burghers hold their land, which, if their vague claims are to be allowed, may be stated as comprising two-thirds of the whole Hill plateau, nominally by permission of the Todars, to whom they pay in acknowledgment of the proprietary right of the latter a "goodoo," or tribute (being synonymous with the word "Yomeah" in Hindustani) which ought, according to the claims of the Todars, to amount to ⅛th of every description of grain produced by the cultivators. This "goodoo" is, however, evaded to a great extent, the Burghers giving to the Todars just what quantity of grain they think fit to part with, and of those descriptions which they can the most readily spare; while some refuse to give any thing at all until compelled by the Todars. This system, in its enforcement without the direct sanction of government, naturally leads to much wrangling and confusion, and may hereafter be productive of mischievous consequences, as the sentiments of the Burghers change, and they view, as they already I think begin to do, this "goodoo" in the light of an illegal and unauthorized impost. They admit that before the days of the East India Company they used to pay ⅛th of their produce to the Todars, but that was when their number was small; and when more of their tribe came from the north country to join them, and when they began to imbibe notions of independence from the Europeans, they reduced their tribute, until it has arrived at its present footing, that of a "Yomeah" or voluntary contribution.

In speaking of the collection of the "goodoo" by the Todars, the Burghers speak of the collectors as "peechakarur" (which means "beggars"), a term sufficiently explanatory of their view of the question of right on the part of the Todars to demand the tribute.

Tenure of the Kothers and Erulars.

The Kothers hold their lands under the same terms. The Erulars hold the patches of land which they cultivate and which are all situated to the eastward, near Rungaswamy peak and the Kotergherry pass, independent of the Todars, who profess not to assert any proprietary right over the lands which extend below the actual summit or plateau of the Hills. The Erulars have a loose kind of tenure of their land, holding it at pleasure so long as they pay the assessment. But they cultivate so little that it is scarcely worth noticing.

Modes and rate of assessment.

The assessment on lands on the Neilgherries is divided into two classes, one applicable to

those held by the native agriculturists, and the other to those occupied by European settlers.

It is levied on the former according to the measurement of fields actually bearing crop, estimated in "vullums" (pronounced sometimes "bullahs"), each vullum being equivalent to 2 cawnies, 21 grounds, and 864 square feet; or in English measurement 1 vullum $= 3\frac{41}{50}$ acres: the rate of assessment being fixed according to the nature and abundance of the crop which the land is bearing at the time of measurement. When harvest time approaches the ghomastahs and curnums proceed to the different villages, and form an estimate of the probable out-turn of the crop on each field from its appearance, rating it as first class if it promises to be abundant, and as 2d class if otherwise.

The highest rate levied is on lands cultivated for potatoes which pay

	7	rupees	per	vullum	for 1st	class	ground.
and	5	,,	,,	do.	,, 2d	,,	do.

The next rate in the scale of assessment is applied to lands bearing

Wheat, which pay for 1st class	ground	Rs.	3	8	5
and ,, 2d ,,	do.	,,	2	5	7
Barley, which pay for 1st ,,	do.	,,	3	8	5
and ,, 2d ,,	do.	,,	2	5	7

per vullum, and the same for poppy, vendium, mustard seed, garlic and onions.

The lowest rate applies to raggee, samee, koralley, peas, shanungee and tenney, all of which pay Rs. 2 0 11 per vullum, for 1st class land, and for 2d class ,, 0 14 1 do.

For further particulars regarding these rates of assessment and their equivalents per cawny and per acre, I may refer to the table at page 26 of this memoir.

Lands held by Europeans, whether by grant of Government within the limits of the cantonment, or purchased from the Hill people in more distant localities, pay assessment as follows:

For ground occupied as sites of buildings....Rs. 5 4 0 per cawny
For ground appropriated for gardens and general agricultural purposes.................. ,, 1 2 4 do.

Labour employed and its remuneration.

The description of people, available on the Neilgherries as labourers, differs according to the situation of the land on which they are required to work.

Thus in, and about the settlement of Ootacamund, the coolies employed are all emigrants from the plains of Canara, Malabar and Coimbatore, or from the Mysore territory; the Canarese and Mysoreans being the most numerous.

Their remuneration is commonly $2\frac{1}{2}$ annas per day, or $3\frac{1}{2}$d.

In the vicinity of Burgher villages, and especially about Coonoor and Kotergherry, Burgher labour is available in abundance at the rate of 2 annas per diem, and they are extensively employed by settlers to cultivate their gardens and to work on plantations. Carpenters and bricklayers are mostly people from Paulghaut in Malabar, or from Coimbatore; their rates of pay vary according to their expertness, from 8 annas a day to 6. Stone cutters work by the piece, receiving on an average, for smoothed granite slabs, steps, coping stones, &c. 8 annas per running foot, of about 1 foot by 6 or 8 inches, breadth and depth; sawyers in like manner work by the piece, at the rate of about Rs. $2\frac{1}{4}$ per 100 feet of surface cut. It is difficult to obtain the services of this class of artizans on the Hills, as they all resort to the teak forests at Musneum Coil and Tippacadoo, near Seegoor, where they always find abundant employment.

Brick makers and tile makers work of course by contract, at the rates already specified under the head "Prices of principal products."

There are several tolerable blacksmiths, silversmiths, and abundance of tailors settled in Ootacamund and the minor stations; while on the eastern side of the Hills the Kothers are generally employed as artizans for rough smith's and carpenter's work.

These Hills possess a great advantage in regard to labour, which is, and always must be, abundant; because as soon as the seed is put into the ground in the adjacent low country, the poorer class, or labouring men, are thrown out of employment until harvest time is past, unless some extensive public work happens to be in progress, and therefore come to the Neilgherries for work in preference to wandering away to Ceylon and other parts to search for it, whenever a demand exists here for their services.

The common rate of pay to all such labourers employed on plantations is 4 rupees a month, and for this sum they labour contentedly for 9 hours a day, performing work which, though it cannot be compared with negro labour, must nevertheless be pronounced cheaply remunerated at the rate quoted above.

Rivers.

There are no navigable rivers in the Hill district, although one of the many which take their rise amongst these mountains called the "Moyaar" swells into a stream of considerable width and depth at Pykara, where it is crossed by means of a double ferry boat and a ford. This river rises at the foot of the remarkable mountain called "Makoorty Peak," receives the drainage waters of the Pichul and Pykara vallies, and, descending the Hills at the N. W. angle by a fall near Neddiwuttum, turns due east after reaching the plains, and flowing round the base of the Neilgherries on the northern and eastern faces, unites itself, near Danaikencotta in Coimbatore, with the Bowany.

The Moyaar.

The Bowany.

This latter river takes its rise amongst the southern spurs of the Koondahs, receiving near the foot of the Madoor or Shoondaputty ghaut a large tributary which rises near the "Avalanche" on the N. E. face of the Koondahs, and swelling into a large stream near Matepolliem, where it is crossed by a large masonry bridge, continues its course eastward, after its junction with the Moyaar, until it flows into the great Cauvery near the town of Bowany.

The Calicut river.

Another important river, which also owes its origin to the Neilgherries, is that which flows into the sea at Beypoor near Calicut. The head of this stream is formed by the drainage of the elevated tabular mass of hills, which have been before described as occurring to the N. W. at Neddiwuttum, and though it descends the face of the Hills at no great distance from the fall of the Moyaar, the intervention of a sharp spur diverts its course into an exactly opposite direction, forcing it over the ridge called the Carcoor or Yellamullay Hills to find its way to its embouchure on the western Coast, while the waters of the Moyaar discharge themselves into the sea on the eastern.

Swamps useful in retaining water.

The Neilgherry mountains afford a great, and, practically speaking, inexhaustible supply of water by means of the innumerable swamps and morasses which occupy the hollows of most of the vallies, particularly to the westward and northward.

The rain which falls during the wet season instead of running off to waste at once, as it does from the surface of the hard ground, is imbibed and retained by these morasses to such an extent, that through-

out the year, including the whole of the dry monsoon, a constant and abundant supply of water is yielded from these natural reservoirs, which seem provided to obviate what, but for their occurrence, might, after unusually dry seasons, be the evil of drought in the district.

Owing to this cause there is scarcely a stream or rivulet on the Neilgherries, which ever completely dries up at any period of the year, even in the most unfavorable weather, and hence a supply of water is constantly descending, to swell and feed the streams by which the surrounding low country is irrigated.

Lake.

The only sheet of water which merits the appellation of a lake is one situated at Ootacamund within the cantonment, formed by throwing an embankment across the narrow outlet of a valley through which a considerable stream, fed by numerous swamps in the neighbourhood, used to flow, and thus arresting its waters, and accumulating them so as to form a lake or tank. The object with which this sheet of water was produced was purely ornamental, a drive having been made round it for recreation and exercise, resorted to by the residents of Ootacamund. The surplus water is drawn off by means of a sluice at the bottom of the embankment, and continues its course to the north as before.

Means of irrigation.

Gardens and cultivated grounds requiring a regular supply of water (as poppy fields) are irrigated, where circumstances allow of it, by means of channels led off from the valley streams ; but the dry grain cultivation in the different parts of the Hills is sufficiently assisted by the rains and by the moisture which the soil, from its composition and depth, has a great tendency to retain.

As the value of land increases on these Hills, and their capabilities become more thoroughly appreciated—as begins to be already apparent from the increase of permanent settlers on them, both European and native—it will I think be found highly necessary to establish some stringent regulations for the control and appropriation of the water of the Hill streams. In the valuable despatch of the Honorable Court of Directors to the Supreme Government upon the subject of the Dheyra Doon and Gorruckpore survey, dated 23d February, 1842, by the resolutions laid down in which it would appear by their despatch to the Government of Fort St. George, para. 12, No. 13 of 1843, Revenue Department, the Honorable Court desire that all matters relating to the Neilgherry district should be adjudicated, it is

specified (in para. 63) "that the control of all streams and canals be in the hands of government."

Much litigation constantly going on about rights of water.

This principle of control does not certainly obtain in this district at the present time—parties cutting channels and leading off water from a convenient stream at pleasure, without any permission asked or obtained from the civil authorities, and frequently without the consent or knowledge of the proprietors of lands through which their channels are brought. No system is observed in the management of these channels, so that where a slight deviation in their course might render the water available for neighbouring lands, we find such a principle of accommodation neglected, and frequently an immense and reckless waste of the element permitted, amounting to a hundred times more than is made in any way available by the self constituted proprietor. Other parties again, whose land lies between a head of water and the ground of another proprietor, refuse permission to the latter to lead it through their premises, to his own, thereby inflicting injury on the individual, and causing detriment to "the property of government," for as such, under para. 61 of the Dheyra Doon Despatch, the Honorable Court have decided that "all grants are to be considered," being merely held as "leasehold land under Government." On this subject I would beg leave to suggest that as "Government are to retain control of all streams" on these Hills, and as the lands cultivated as gardens pay a high rate of assessment, the same system as to the distribution of water for the use of each proprietor, should be followed in this district, as prevails in the low country, where not a cubic foot is allowed to be wasted or misappropriated. This interference on the part of the Government authorities does not seem called for in any other parts of the Hills than the stations where Europeans, East Indians, and Natives have settled, viz., Ootacamund, Coonoor, and Kotergherry, as the Burghers and other aboriginal cultivators make no use of water for the purpose of irrigation save for poppy, onion and garlic fields, which are not so numerous as to have given rise to any disagreement between adjacent villages upon the subject: whereas at the settlements it affords a fertile, and constantly recurring cause for litigation and misunderstanding.

Towns and villages.

The only town on the Hills, properly so called is "Ootacamund," and even this term can only be applied legitimately to the native portion of the settlement, since

the residences of Europeans are too widely dispersed along the slopes of the valley in which the station is situated, to admit, at present, of its further extension. So rapidly however is the number of houses increasing and keeping pace with the increased resort of Europeans to these Hills from almost all parts of India, while at the same time a consequently augmented demand for supplies for the European community is daily drawing more native merchants and traders to the place as permanent settlers, and thus swelling the size of the bazaars beyond all bounds, that before long the term "town" will not be inappropriately applied to the whole settlement, while that of "cantonment" will be transferred to the valley of Jukatalla where the European barracks are about to be built. The houses of the European inhabitants of the settlement are for the most part substantially built; the walls are usually of burnt brick set in clay, and pointed or plastered with lime, roofs of tiles, or puckka terraced, and rarely of thatch, while all the timber work of the roof, doors, floors, &c., &c., is of teak, which is brought at a great cost up the Seegoor pass from the forests on the borders of Mysore. There are however many excellent and durable descriptions of house building timber to be procured on the Hills at one quarter the cost of teak; but a prejudice exists against their use, because roofs constructed with Hill grown timber have, in some instances, been found to decay with great rapidity; and hence its employment has been condemned by builders, who have overlooked the real cause of its decomposition, which is its being put together and covered in before it has been sufficiently seasoned. As an instance of its efficiency, if attention is paid to this important point, and the wood properly selected, I may mention that the present survey office has a roof, made entirely of jungle wood cut on these Hills, which has been standing more than 20 years, and which on a recent examination was found to be perfectly sound. All other building materials (except lime) are procured on the spot, abundance of tolerably good brick clay being found in every part of the Hills.

Much good timber for building to be obtained on the Hills.

Bricks and tiles very bad.

The bricks and tiles made are, however, very inferior, but this is owing to the wretched way in which the clay is worked and moulded. A labourer mixes a little water with it with a mamotie, treads it for a few minutes with his feet, and then pronounces it tempered, and carries it to the moulder without further preparation. Bricks can be contracted for in Oota-

camund, delivered at the kiln at Rs. 2 per thousand; and tiles Rs. 1 ,, 12 per thousand. Lime, as I have elsewhere observed, does not occur, or at least has not yet been found, on these Hills; and

Lime dear.

hence, having to be brought on bullocks from the plains, it forms the most expensive item in building estimates. Its use is economized as much as possible in house architecture, by using mud as a cement to set the bricks in, in constructing walls, reserving lime only for use in turning arches, ridging the tiles in the roof, flooring, and either pointing or plaster-

Clay used as cement for walls.

ing the walls outside, with which protection, brick and mud walls are found to answer very well, especially if the roof over them is kept tight, and their surfaces screened from the beat of the rain against them by a verandah. In the bazaars of Ootacamund, which are called "the bazaar" and "Caundle bazaar," the houses are of all descriptions, both puckka and cutcha. The streets are wide and well kept by the police authorities, by whom a tax varying from 1 anna to 1½ on each house per mensem is levied to support the scavenger establishment, the residue being paid into the public treasury—and if good regulations are enforced as regards the laying out of future quarters of residence, already fast extending, the town which the bazaars will constitute will become a very cleanly and compact one—and hence doubtless healthy also. It has the advantage of being bordered by the lake or tank, which adds of course materially to its means of preserving cleanliness.

The following is a return of the European and Native population of the three settlements taken in February, 1848, and although many present inhabitants with their servants and followers will have left the Hills before the year ends, the total numbers may yet be taken as a pretty correct average of those usually residing, as of course the place of those removing is soon occupied by fresh comers from the plains.

Population of the European settlements on the Neilgherry Hills.

	Europeans.				East Indians.				Hindoos.				Mussulmauns.				Pariahs.				Number of European Houses.	Number of Native Houses.
	Adults.		Children.		Adults.		Children.		Adults.		Children.		Adults.		Children.		Adults.		Children.			
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.		
Ootacamund,	93	97	57	66	38	34	22	23	935	828	431	501	341	238	130	143	1642	1506	732	752	146	1743
Kotergherry,	9	5	4	4	8	6	11	12	49	49	17	20	7	5	3	1	56	55	22	24	15	98
Coonoor,	5	2	0	0	1	1	0	0	80	65	32	29	9	9	8	7	50	60	20	19	15	131
Aravungaad*,	0	0	0	0	0	0	0	0	3	3	2	1	0	0	0	0	6	7	4	4	0	12
Total Population.	342 Souls.				154 Souls.				3045 Souls.				901 Souls.				4941 Souls.				176	1984

* A small Native settlement in "Sappers' valley," between Kaitee and Coonoor.

The settlement of "Ootacamund" is situated in an extensive open valley, almost in the exact centre of the Hills, open to the westward, but bounded on the north, east and south by the great Dodabetta range, or spurs projecting from it westward.

The settlement of "Coonoor" is situated on the crest of the Hills in the S. E. angle of their summit, the residences of the Europeans, including an hotel, being placed on the rounded tops of a range of hills which runs from a high mountain called "Coonoor-betta" towards the top of the pass, while the bazaar or native residences are in the hollow below, and adjacent to a masonry bridge which spans a wide stream flowing from the Jakatalla valley and descending the Hills at this point in a large volume of water.

The settlement of "Kotergherry" which with that of "Dimhutty" which is contiguous to it, is the oldest on the Hills, is situated in the N. E. angle of the plateau immediately overlooking the low country and at the head of the Kotergherry Ghaut. The bazaar which is increasing considerably in size, is built on the same range, with the residences of the Europeans.

"Dimhutty" cannot now be called a settlement, since there is but one habitable residence existing there; all the bungalows built long since by government for the accommodation of invalids, having gone to ruin and become unfit to occupy or repair. The temperature is warmer at this place than at any of the other three settlements, and hence it is very rarely resorted to by Europeans. Under this head may be enumerated the Public bungalows and chettrums, or caravanserais, for the accommodation of travellers, Native and European, and which are under the control of the officer commanding the Neilgherries, and kept in repair by him at the public expense.

Accommodation for travellers.

List of places of accommodation for Travellers.

	For Europeans.	For Natives.
At Ootacamund,	None.	1
„ Coonoor,	1	1
„ Kotergherry,	None.	None.
„ Neddiwuttum,	1	None.
„ Pykara,	1	None.
„ Kulhutty (Seegoor pass,).	1	None.
„ Nunjanaad (Koondah road,).	None.	1
„ Avalanche (ditto)	1	1
„ Burliar (Coonoor pass,)	None.	1
„ Kaitee (Coonoor road,)	None.	1
* Total on the Neilgherries..	5	6

* (Exclusive of the Koondahs.)

Villages. Situations and general description.

Toda munds.

The total number of Toda villages, called "Munds," on the Hills is 85, the whole of which, with the exception of 11, are situated in the division called the "Toda-naad" and almost all to the extreme west of that part, approaching the Pykara or Moyaar river. They seldom comprise more than three residences or huts, with one building consecrated to their deity, and which is also the dairy or place in which their milk, curds, ghee, &c., are kept, and one large circular pen for their cattle, surrounded by a substantial stone wall, and closed by sliding bars at one opening for entrance and exit. The sites chosen for these munds are in general most picturesque—always adjacent to a wood, and usually on an open space of grass almost completely embosomed in it, and extending in gentle slopes covered with the richest turf, which the grazing of their cattle (and the consequent manuring) maintains in the finest order. Their huts are low, arched buildings, resembling a hay cock, but admirably contrived to keep out rain and cold, the roof and side walls forming one continuous curve of split bamboos, rattan and thatch; having an end wall strongly built and a front wall with one small opening or door in it, so small indeed that the inhabitants have to crawl on their hands and knees to enter by it. Besides the dairy there is generally one small hut attached to the mund, in which the calves they breed are kept separate from their dams.

In addition to their villages or munds, the Todars have five sacred places in which only two men reside called "Polaul" and "Capilaul" devoted to a priestly life and living apart from the rest of their tribe. A temple and a cattle pen is attached to each of these sacred munds, which are usually situated in the bosom of a thick wood, so as to be screened from the vulgar gaze.

Burgher villages.

The villages of the Burghers are, in general very neat and clean, the houses, which are few in number, averaging 10 or 12, being built in a row on the summit of a low smooth hill, and having a wide level terrace running along the front, for the purpose of spreading out their grain to dry after damp weather, and also to pick and husk it on. They have usually two substantial cattle pens, or more, according to the size of the village, with high rough dry stone walls and barricaded entrances, to secure their cows and bullocks against cheetahs and tigers, which though not common on these Hills, occasionally find their way up from the forests below—and traverse the district, doing much mischief as

they pass. The houses are built with mud, or mud and stone, and covered with a good roof of thatch, grass for which is abundant in all parts of the Hills. There are altogether 227 Burgher villages on the Neilgherries, viz.

67 in Todanaad.
86 in Meykenaad.
and 74 in Parungenaad.

Kother villages.

The villages of the Kothers, from the fact of their low caste obliging them to consort together in large communities, present the most thriving appearance, and boast the largest number of houses, in general, of any of the Hill hamlets. But owing to their dirty habits, and the want of order in the arrangement of their dwellings, their villages have by no means the neat appearance presented by those of the Burghers. Mud and thatch are the principal materials with which their huts are built, but they form with them very substantial and weather proof buildings. There are six Kother villages on the plateau of the Neilgherries, and one near the foot of the Neddiwuttum pass, situated on a low spur projecting from the foot of "Goodlur Mullay," but as the survey does not include the site, it has been omitted in the return.

Erular villages.

The villages of the Erulars are more numerous, there being 22, all situated in the eastern part of the Hills. With a few exceptions they are very small, comprising only 5 or 6 houses and a couple of cattle pens. Their sites are selected in low spots, near the patches of plantain and other fruits which these people cultivate. The houses are of much the same description as those of the other tribes already described, and are generally very dirty. There are more Erulars to the south, but they are situated far below the plateau to which the survey has been restricted, and no account has, in consequence, been taken of them. The same is to be said of the Coorumbur villages, if indeed that term can be applied to the collections of scattered sheds, in which this wandering race are occasionally come upon in the jungles below the crests of the Hills. From their mode of life it is found impossible to obtain any return of their number.

Population.

Appended to this memoir will be found tables furnishing all particulars of the several tribes, constituting the body of aboriginal settlers on these Hills, and

of the European and other inhabitants of the three settlements. The following is the summary.

		Souls.	Souls.
	Europeans including Children	0	342
	East Indians do. do.	0	154
	Hindoos do. do.	3045	
	Mussulmauns do. do.	901	
	Pariahs do. do.	4941	
			8,887
Hill Tribes.	Todars do. do.	337	
	Burghers do. do.	6569	
	Kothers do. do.	307	
	Erulars do. do.	461	7,674
	TOTAL POPULATION OF THE NEILGHERRIES.		17,057

Deducting from the total area of the plateau, that portion lying to the westward of the Pykara, or Moyaar river, which I have elsewhere described as almost entirely uninhabited, there remains a space of 420 square miles over which this population is distributed, giving a proportion of 40 souls to one square mile.

For the reasons already stated under the preceding head, no place or number can be assigned to the tribe of Coorumburs in this statement. Their number must however be very insignificant, probably not above 2 or 300 souls.

Employment.

With the exception of the Todars, who pass their days in utter idleness, all the aboriginal tribes, or mountaineers of the Neilgherries, devote themselves to agricultural pursuits. With these duties the Kothers alone combine those of the artizan in a humble way, as will be treated of in describing the people of that tribe.

The Todars, or Todawars.

Total number 337 souls.

This remarkable race differ in almost every essential respect from all other tribes of the natives of Hindustan, and their singular characteristics and strange habits have given rise to much speculation as to their origin and history. As no clue has however yet been discovered either in the form of monuments, coins, or even in their own traditions, by which research could be directed, all theories broached upon the subject cannot be otherwise than vain and illusory, especially those which have been based upon the assumption that the images, bones and other relics which are found in

the remarkable "cairns," discovered in such numbers all over the Hills, belonged to the ancestors of the Todars.

That these are not relics of the founders of their race is proved by the present people denying all knowledge of the history of the cairns, even by tradition; and by their looking on at their desecration with as much curiosity and indifference to the sacrilege, as is displayed by the antiquarian explorer, whom they have perhaps guided to the spot. In form and countenance the appearance of the Todars is remarkably striking. Tall, well proportioned and athletic, their bold independent carriage, and finely moulded and sinewy limbs attest that they can be sprung from no effeminate eastern race, while their aquiline nose, receding forehead, and rounded profile, combined with their black bushy beards and eyebrows, give them so decidedly Jewish an aspect, that no beholder can fail to be impressed with the idea that they must, in some way, however remote, be connected with one of the lost and wandering tribes of the ancient Israelites. Their dress is as peculiar as their habits and appearance, consisting of one single cloth, a sort of toga, which they wear after a fashion well calculated to set off to advantage their fine muscular form, being disposed about their person like the plaid of a Scottish Highlander. They have no covering for the head of any kind, but never allowing knife or scissors to approach their hair, they suffer it to grow into a mass so thick and bushy, as to form a most effectual protection from the inclemency of the weather. The women are rather fair in complexion, the hue being a dull copper colour in both sexes, and are generally handsome in feature as well as in person, which is tall and well shaped like that of the men, their attire being equally simple and peculiar. The little occupation which the Todars permit themselves to engage in, is solely of a pastoral kind. Considerable herds of buffaloes are attached to each mund, and to milk these, convert their milk into ghee, drive them out to pasture in the morning and home at night, and to keep their huts and the walls of their cattle pens in repair, constitute the sum of their employment, from year to year of their useless existence. Their food consists of curds, milk and ghee mixed with whatever grains they can obtain from the agricultural tribes in the shape of "Goodoo" or tribute for the lands which the latter cultivate, and over which the Todars assert an imaginary proprietary right. I observe that the Honorable Court in their dispatch express a hope "that in

Personal appearance very striking.

Dress peculiar: the toga worn.

Revenue Department. No. 13 of 1843, para 11.

course of time they may be induced so far to change their habits as to bring the lands in the vicinity of their munds into cultivation." I fear as long as this practice of receiving their grain from the Burghers and Kothers remains in force, there is but little chance of this desire being realized, and the only inducement, in my opinion, by which they would ever be brought to condescend to yoke their powerful buffaloes to a plough, and take the handles in their hands, would be that promoted by the stoppage of their supplies by the removal of the "Goodoo" imposition, and their consequent reduction to the primitive state of life, which, by their own account, their forefathers led before the Burghers came to settle on the Hills.

Traditionary history.

Their own idea of their history is that "their ancestors came from no where;" that they were created on these mountains, and that for ages no other living soul approached them: that their dress was of leaves and their food the produce of their cattle and the roots and fruits of the forest. That at length some Kothers found their way to the neighbourhood of their munds and craved permission to cultivate land and build their huts, which was given, on condition of their making offerings to them (the Todars) of a portion of their produce. That soon after this, some Burghers or "Buddaghars" came up the Hills and observing the success which had rewarded the adventure of the Kothers, asked permission to settle also and obtained it on condition of the payment of the "goodoo" or tribute of ⅙th of their entire harvest. More Burghers soon followed the first comers; the amount of the "goodoo" became extensive; the habits of the Todars changed; the cotton embroidered toga took the place of the mantle of leaves, and messes of grains of many descriptions pampered the appetites of beings, who were before as primitive in all things as their native hills. With increase of numbers however the deference of the Burghers for them diminished, and with it the amount of the "goodoo," which received a great acceleration in its decline by the coming of Europeans to the district; when the Burghers observing their indifference to the alleged claims of sovereignty of their hitherto feudal landlords, gradually assumed the position of donors of the "goodoo" of free will, and as a charity; and hence reduced its amount as the circumstances of an abundant or poor harvest, or their own wants and inclinations, directed. Upon this footing, as far as I have

Institution of the "Goodoo."

been able to arrive at a right understanding of the question, the "goodoo" appears at present to rest. The Burghers profess not to desire to be relieved from it as a tax, because to give it as a donation to the Todars has become with them a time honored custom, which their prejudices forbid them to break through; but it seems to me evident that they are not disposed to admit the absolute right of the Todars to demand it, and hence their allotment of the quantity of the produce which they are to bestow under the name of "goodoo," according to their means, their own wants, or fancy. Any thing more utterly useless, or unproductive in the social scale, than the life led by the Todars, it is impossible to conceive. Endowed with great physical strength and capacity to endure fatigue and vicissitudes of weather, and hence eminently fitted for a life of agricultural industry or other active employment, this fine race, instead of legitimately developing the powers which have been given to them, devote their lives to the unprofitable end of herding a number of buffaloes, the only use of which is to produce the small quantity of milk required for the use of the few families which congregate together in each mund, and to furnish sacrifices to the manes of any one of their male proprietors who dies.

Unprofitable and idle life led by the Todars.

Their herds are a nuisance and a pest to the district, for being exceedingly wild and ferocious, especially to Europeans, they frequently attack persons travelling on the high roads when not attended (as is generally the case) by a herdsman, and serious accidents occasionally result. Whatever may have been the attributes of the Todars when Europeans first became acquainted with them, they appear at the present time to be decidedly as indolent, mercenary, and sensual as any of the worst tribes in the plains; and but for the meretricious interest which attaches to them through their singular mien, costume and habits of life, and the mystery in which their history is enveloped, they would be deemed a perfect cumbrance to the soil.

Religion, pagan.

Their religion is of course pagan, and engenders the usual superstitions and prejudices. They have no distinct "samee" houses, or places of idol worship, but devote to this purpose the dairy or hut in which they keep their milk, ghee, &c., and in which they offer, by libation, to their deity, such milk as is not consumed in the daily use of the tribe. Their domestic rites are as strange and barbarous, as is all connected with this singular people. The wife of one amongst several brothers is common to the whole circle; and every woman besides her husband

has a certain number of gallants, who reside with her at pleasure and by turns. To such practices as these it is doubtless to be attributed that this race does not increase in numbers, and is evidently deteriorating in physical endowments.

The great mass of the Todas inhabit the vallies and woods to the westward of the plateau, being confined with the exception of five inhabited munds in Parunganaad, and two in Meykenaad, to the division called Todanaad—and it will be seen by the map, that in this portion of the plateau their munds are principally congregated to the westward, apart from the villages of the Burghers, only a few in the neighbourhood of Ootacamund and to the northward being interspersed amongst their cultivated lands.

Desirable if possible to restrict the Todars to the western confines of the Hills.

And to this portion of the Hills, viz. to the extreme westward, it would be highly desirable that the whole tribe should be restricted; as they would have the benefit of abundance of excellent pasture land for their cattle, and being there entirely apart from the other inhabitants of the Hills, would be free to carry on their rites and superstitious observances, without hindrance from others, and without the possibility of causing annoyance to the rest of the population. It has been distinctly stated to me by the Todars, Burghers and the talook Civil authorities, that the Burghers whose villages are situated in Todanaad have to support, by payment of the "goodoo," all the Todars who occupy munds in that division, without aid from the Burghers of the other two naads, who are only bound to maintain the Todars who actually reside within their respective limits. Hence an apparently palpable injustice to the Burghers of Todanaad, since, as will be seen by the census returns, the tribe are pretty equally distributed throughout the three naads; whereas out of a total of 337 souls, of which the tribe of Todars at present consists, only 42 are located in Parunganaad and 10 in Meykenaad, while all the rest, amounting to 285, are located in Todanaad. This seeming difficulty in equalizing the infliction of the "goodoo" impost is overcome in the following manner. As soon as harvest is over, and the "goodoo" collected in Todanaad, the Todar men of that division pay visits to the munds in Meykenaad and Parunganaad, and take up their abode with the women of the community (to the temporary exclusion, as is their custom, of the legitimate husband.) They then pay visits to the surrounding Burgher villages

Levying contributions on the Burghers.

and demand, in their right as temporary husbands of women of the naad, the "goodoo," which, strange to say, is paid; and thus the same man perhaps who has laid a whole village in his own naad under contribution, goes the round of the other two naads appropriating the fruits of the Burghers' labour and industry, and carrying off enough grain to support his whole community in idleness and plenty until the arrival of the next year's harvest time—and to produce by sale in the nearest bazaar, sufficient money to pay the tax or "pillooverry," which is levied yearly on their tribe. I should have refused credence to such a statement had I not received it on the best authority, that of the Tahsildar of the district.

Migrate from mund to mund.

The habits of the Todars are migratory, almost every community or particular group of families consorting together, having two or more munds or villages belonging to them, between which they divide their time according to custom, fancy, the state of the weather, or other circumstances, such as the death of one of their body, upon which occurrence they immediately migrate to another mund. The grass upon which they pasture their buffaloes is of a coarse rank description, fit only for those hardy and powerful animals; but by burning it down, as is their practice, just before the rains set in, when they are about to migrate to another mund, a fine tender young grass, highly nutritious as pasture, has replaced the ashes of the old grass by the time they return to the mund, round which they had run their fires.

Fine breed of buffaloes decreasing.

According to their own statements, the fine breed of buffaloes which seem peculiar to the district is rapidly decreasing, murrain and other diseases having of late years carried them off, in far greater numbers than are bred to supply their places. Doubtless the system of perpetual inbreeding aids in their deterioration. There are some Todar munds on the "Koondah" mountains, but as that range is not in this talook, no information relating to them can be gained until the survey has been extended in that direction. While speaking of the Todar buffaloes, I should mention that a few only of the small calves brought forth by their cows are preserved for perpetuating their stock, and all the rest killed while young, and eaten by the Todars themselves. If these calves were castrated and reared, they would be most admirably suited from their great strength, to drag proper iron ploughs over

Tax paid by the Todars to government.

the steepest and most difficult ground. The Todars pay an annual tax to Government of 9 annas and 5 pice per head on all the female buffaloes herded by them, the bulls being exempt from tax ; and, in addition to this, they pay a small assessment on grazing land, called " pillooverry" or grass tax, at the rate of one quarter of the sum fixed as the lowest class assessment for cultivated land per vullum ; the quantity of land which they are called upon to pay being estimated according to the number of buffaloes herded at each mund, at the rate of about 10 vullums per 100 head of cattle. The amount of revenue collected from the Todars in 1847 was

	on account of tax on Buffaloes......	Rs.	960
and	do. do.. Pillooverry......	,,	400
	Total Rupees..		1360

The Kothers: 307 Souls.

The Kothers rank next to the Todas, according to common tradition, in seniority, as occupants of the Neilgherries.

They are of low caste, equivalent to that of the Pariah in the plains, and consequently are always found dwelling by themselves in isolated villages, of which there are only six on the plateau of the Hills, and generally called after the race "Kother-gherry." Around each village they have lands, considered and admitted by their Burgher or Todar neighbours to be exclusively their own, no disputes about boundaries, or the right to certain tracts, occurring amongst them at any time, so far as I can learn. The Kothers are an exceedingly industrious and useful race. They give all their time to husbandry when the land calls for their care, but when the seed is in the ground and their time disposeable, they employ it in all sorts of mechanical avocations, repairing the ploughs of their own and the neighbouring villages, as well as bill hooks, mamoties, and all other farming implements, and executing a great variety of smith's and carpenter's work.

It is by these people that the buffalo, and other hides of Hill cattle, which are so much prized by the workers in leather in the plains and which should form a very important item in the export list of the district, are dressed and prepared for the purposes of commerce, the Kothers being very expert curriers.

In common with the Burghers they pay " goodoo" in grain to the Todars of their naad, in acknowledgment of their feudal proprietary

right over the land which they till, and which it appears the Todars, in spite of their own purity, and the uncleanness and low caste of the Kothers, do not hesitate to receive and eat, though no Burgher would touch grain so polluted. The Kothers are not extensive cultivators, bringing only land enough under the plough to yield the quantity of grain required for the use of the village, with a small surplus, which they barter with the low country traders for iron to carry on their forges.

Hence by far the greater part of the land to which they lay claim in the vicinity of their villages remains waste, and is likely to do so, as long as the present proprietary system continues in force. In some parts of the Hills this land is of a very fine description, which, according to their explanation, is to be ascribed to their having come to these Hills the first of all the agricultural tribes, and thus enjoyed the privilege of selecting the best land.

Their religion is of course idolatrous : their marriage customs and ceremonies are not very dissimilar to those observed amongst the people of the Pariah caste in the plains, and they have no plurality of wives, or of husbands. They are impure and dirty in their habits, eating the flesh of cattle which die by the roadside of disease or in the jungle : hence their neighbours the Burghers, though living ostensibly on amicable terms with them, account it pollution to eat with them, or associate with them in their households.

They breed small cows and bullocks, but no buffaloes, and they have a singular and wasteful practice of never drawing the milk from the cow, and allowing the whole to go to the calf which they kill and eat on feast days.

The total number of Kothers on the Neilgherries up to 31st December, 1847, was found to be.... Males, 157 } Total 307 souls,
Females, 150 }
including children of both sexes.

The Burghers.

The Burghers or "Vuddaghurs," signifying literally "people of the North," are supposed to have emigrated to the Neilgherries from the northern part of Mysore or Canara, during a season either of famine or political persecution, and finding their soil and climate good, and their pre-occupiers peaceable and disinclined to molest them, they settled on them; and, meeting with success in their early agricultural operations, they soon induced others of their countrymen to follow them, and thus

formed the nucleus of the numerous tribe now recognized as the chief and most important portion of the Hill population.

Their villages, which have been already described under another head, are scattered all over the plateau of the Hills, excepting the portions to which I have already adverted, as inhabited exclusively by the Todars, viz. the northern and western parts of the "Todanaad" Division, and the north-eastern angle of the "Parungenaad" called "Kodanaad;" and with the exception of these tracts, a small extent of pasture land in the vicinity of four Todar Munds which occur near Coonoor and Hoolicull, and the lands in the possession of the Kothers, they may be said to arrogate to themselves a right of direct proprietorship over the whole of the lands comprising the Hill plateau. They admit the fact of their holding it under tribute to the Todars, and render to them the "goodoo," or free will offering, in acknowledgment of the feudal position of this tribe; but at the same time they consider the land so far alienated from their possession, that they, its present holders, are empowered to dispose of it to strangers by sale, gift, exchange, or otherwise; which they accordingly do.

They pay the "goodoo" to the Todars resident in their respective "Naads" or Divisions, who according to their statements pay an annual visit, after the harvest is gathered into the various Burgher and Kother villages, and demand the contribution in kind which is rendered according to the circumstances of the inhabitants, the owner

"Goodoo" often extorted by the Todars.

of a rich house giving usually 1 cundagum = 20 kollagums; and those less opulent from $\frac{1}{2}$ to $\frac{1}{4}$ cundagum according to their means. Sometimes the offerings of the poorer inhabitants are not considered sufficient, and sometimes they refuse to give any thing at all, when confusion ensues; the Todars, according to statements made to me by some of the Burghers, entering their houses and laying them under contribution by force. If such occurrences really do take place it seems likely that

Government interference seems called for.

the interference of the civil authorities of the district will, before long, become necessary either to legalize the exaction of the "goodoo" or to put a stop to it; since, as the law seems at present to stand, a Burgher, from whom a Todar might attempt to enforce its payment, would have a clear right to the protection of the police, who would be bound, on an appeal being made, to treat the Todar as a trespasser.

Such contradictory statements, however, are made by the Burghers, some asserting that they are quite contented to contribute the "goodoo," and have no desire to be relieved from it, while others murmur against its imposition in addition to that of the government assessment, that it is most difficult to discover what their real sentiments upon the subject are—or indeed upon any other in which their interests are, however remotely, concerned.

Transfers of land by the Burghers.

I may remark in connection with the question of the "goodoo" that when the Burghers make transfers of land, within the limits of what they term their territory, to European settlers and others, no stipulation is ever made for a contribution to the Todars, of a portion of whatever produce may be raised by the purchaser; nor do the Todars themselves ever come forward to urge such a claim, or to remonstrate against such alienations of their rights and property.

Many of the Burghers are said to be (for natives) very wealthy, and this circumstance perhaps has induced, amongst many of them, habits of sloth and sensuality inimical to their moral or physical improvement; but nevertheless, when viewed in comparison with other tribes of Hindoos, they cannot be pronounced pre-eminently indolent, or degraded in their habits. They are utterly illiterate, and their ignorance of the accomplishments of reading and writing are transmitted to their children, since schools for their education are unknown amongst them. Their religion is Hindoo, and they are of the Siva sect, their principal deity however being Rungaswamy, whose temple is situated on the summit of "Rungaswamy's Peak," the easternmost point of the Neilgherries, and in addition to whom they also worship many other inferior divinities, male and female.

The Burghers Hindoos of the Siva sect.

There are several subordinate sects amongst the Burghers, the chief of which is that of the "Aroovurs," who assume to be Brahmins, and wear the sacerdotal string over the shoulder; next the Sivacharries, the Wodiars, Kunukars, Burghers and Toriars—the last being the lowest caste amongst the tribe, and generally the poorest. Their ceremonies of marriage and burial do not differ essentially from those observed amongst the Hindoo tribes in the plains, and such differences as exist are only under the first head, and are chiefly remarkable for their indelicacy, and not worthy of notice. The Burghers are a most superstitious timid race,

Very superstitious and timid.

perpetually filled with the dread of evil spirits hovering around them, and ever haunted with fear of the "Coorumburs" (a tribe to be hereafter described), to whose necromancy and demoniac influence they attribute all accidents and infirmities which befall themselves, their families, cattle or crops. To such an extent is this feeling carried, that murders of the most brutal description have been known to be perpetrated upon the unfortunate Corumburs, for which, although in general it is found difficult to obtain evidence to convict the perpetrators, Burghers have been tried and executed, much to their indignation and astonishment; since the principle inculcated amongst them appears to be, that to sacrifice a Coorumbur (and in some cases whole families of them), through whose preternatural agency disease has been brought into a village, or murrain amongst their cattle, is the only way in which the evil can be averted, and the anger of the deity of destruction appeased. Yet notwithstanding this intuitive horror of their influence over the common affairs of their

Stand in great awe of the Coorumburs.

lives, they regard the Coorumburs with the utmost consideration in many other respects, looking upon them as priests, or rather enchanters, whose favor must be propitiated to secure their intercession with the geniuses of good and evil in their favor.

For example, in the spring when a field is ready for the seed, the work of husbandry cannot proceed until a Coorumbur has been summoned, a kid sacrificed to a goddess equivalent to Ceres, the soil blessed, and the first handful of seed scattered over it by him. In like manner, a Coorumbur must drive the first plough a few paces, before their work of tillage commences; and at harvest time not a grain or ear is reaped until a small sheaf has been cut by a Coorumbur. For these offices, the Coorumburs receive gifts in money and produce, and finding their interest in the existence of these superstitions, doubtless encourage them by all the means in their power which they can safely employ. The Burghers seem to live in great harmony amongst themselves, ruled by their head men and elders. They are fond and careful of their families, and pay great respect to the aged, but in character they appear deceitful, ungrateful, and false.

Their women and children all labour in the fields at the time of harvest, as well as in preparing the ground for seed; and by this combination of industry it is easy to foresee to what a successful extent their farming operations might be carried, if a better system of husbandry could be introduced amongst them. The total number of

Burghers resident on the Neilgherries in December, 1847, has been found by the census to be as follows :—

Males,	3346
Females,	3223
Total Souls	6569

including children of both sexes, viz :

In Todanaad,	2039
In Parungenaad,	2377
In Meykenaad,	2153
Total	6569 Souls.

The Erulars.

The number of this singular tribe is small, amounting only to

Males,	225
Females,	236
Total Souls	461

including children of both sexes. They are found principally in the eastern part of the Hills, where they cultivate the lower slopes, forming the broad deep vallies which run in the vicinity of Rungaswamy's Peak towards the plains. They raise crops of raggee, koralley, shamee and mustard seed chiefly, but to no great extent, being very improvident in their arrangements, and eating up all their produce at once, without laying any by for the rainy season, when they subsist chiefly on plantains, jack and other fruits, which they cultivate in patches near their villages, and which thrive in consequence of the lower level on which the Erulars are mostly settled. They also work occasionally as coolies on plantations, preferring employment in the jungle to working in the field, and being expert fellers of trees, hewers of planks, rafters, &c. They worship Rungaswamy and some other inferior deities, and enjoy the high privilege of tending the temple and idol on "Rungaswamy's Peak," where two or more of their number officiate as priests at the period of the great festival in August and September, when thousands of Hindoo pilgrims flock to the sacred Peak from all parts of the adjacent country with offerings of all descriptions of produce, and occasionally money. They pay kist to Government according to the nature and quantity of their crops ;

Are Priests of Rungaswamy's temple on the Peak.

but they make no offerings to the Todars in the shape of "goodoo," probably from their occupying land rather below the plateau to which the Todars lay claim. When driven to extremities for food the Erulars betake themselves to the jungles on the slopes of the hills, and, seeming to have no fear for wild beasts, hunt and destroy sambre, spotted deer, jungle sheep, and other game, with great expertness. They also search for bees wax, which finds a ready sale in the plains. But many lose their lives in this pursuit, through the bears which are numerous in the eastern part of the Hills, and whose fondness for honey often brings them into contact with the collectors of wax.

The Coorumburs.

The Coorumburs are not, strictly speaking, a tribe of mountaineers, since many sects of the same people are found in various parts of the plains, especially towards the southward, and those who do frequent the Neilgherries inhabit the lowest slopes, and are perpetually migrating from spot to spot, erecting their little huts usually on grassy patches, in the midst of the densest and most wild forests. Those who are met with on the eastern side of the Hills are called "Mooloo-Coorumburs" implying "thorny" or jungle Coorumburs, to distinguish them in some degree from the Coorumburs of the west country.

They are small in stature, and their squalid and uncouth appearance and wild matted hair might seem to give some cause, with so timid a race as the Burghers, for imputing to them the fiendish and preternatural powers with which their superstition invests them. If a Burgher meets a Coorumbur, not summoned at seed or harvest time, in his path, he will fly from him as from a wild beast; and if too close to escape his dreaded glance, he will return home and resign himself to a fate which he deems inevitable; often in fact inducing sickness by the prostration of body and mind which is thus supervened. I may here mention that a popular belief exists that the Coorumburs have an equal proprietary right in the soil of the Neilgherries, having come to them at a period coeval with, or antecedent to, the migration to them of the Todars. The Coorumburs cultivate some land on the lower slopes of the Hills and raise small crops of dry grain, but they depend for their supplies chiefly on the fees in kind which they receive from the Burghers, for the offices performed by them in consecrating their crops and seed, as has been already described in treating of the Burghers. Those however who are met with in the forests on the western slopes of the Neilgherries are more industrious, employing themselves chiefly

in felling timber for the sawyers and contractors, in making baskets, and, to a small extent, in cultivation.

These Coorumburs appear for the most part to come from Malayalum, where they exist in a state of slavery to opulent natives, who claim their persons as their property—a claim, however, not much regarded. The Coorumburs, from their almost always residing amongst the forests, have a considerable acquaintance with the properties of medicinal herbs, gums, and roots, and hence often effect cures of simple diseases amongst the Burghers and others, when called in to disenchant a member of a family supposed to be bewitched. This success is, of course, attributed to preternatural agency, and a failure in their mode of treatment of a disease is usually set down to its baneful exercise, a result which often leads the officiating Coorumbur into trouble. As has been already remarked, it has been found impossible to obtain any return of the number of this tribe, but it must be very inconsiderable.

Employment.

In the preceding description of the different tribes inhabiting the Neilgherries, their habits have been sufficiently set forth to explain the nature of the employment or occupation which each pursues. Following, however, the argument of this synopsis, it may be necessary under this head briefly to recapitulate them.

The Todars.

Their occupation is purely pastoral; their only manual labour being the milking of their buffaloes, and converting portions of their milk into butter and ghee. They let their herds loose during the day to wander about, almost always unattended by a herdsman, to the annoyance of travellers on the public roads; and, but for the caution observed in approaching these animals, to their great danger.

The life they lead is eminently a most idle and useless one, involving the performance of no offices, and the undertaking of no duties, which tend in any way to the benefit of the community at large. Especially marked by nature as a race upon whom labour, demanding great physical exertion and bodily prowess, should devolve, they are found abjuring the performance of manual labour of any kind, subsisting upon the hard won earnings of others, and acting no part in the great work of social duty and improvement, which society demands that all its members should co-operate to advance.

The Kothers. Their occupation is both agricultural and mechanical.

They are tolerably good workers in iron and execute carpenters' work in a rough way. They tan ox and buffalo hides, and make baskets, and their women manufacture the only earthen pots, or chatties, produced on the Hills.

The Burghers. Their occupation is solely agricultural, and their numbers having of late considerably increased, there is always a superabundance of hands available for employment as carrying coolies and out of doors labourers, when their own crops are either in the ground, or reaped and stored, which constitutes them the most really useful tribe on the Hills.

The Erulars and Coorumburs. Their employment is agricultural, and also, in a measure, vagrant; since, lacking sufficient energy or industry to draw from the soil the utmost of its productive powers, they subsist, between harvest and harvest, upon whatever they can extract from the natural resources of the forests through which they wander.

Languages. The Neilgherries being situated within the limits of the Coimbatore district, Tamil is the language employed in the public departments and in the bazaars and other resorts of the natives from the low country; but amongst all the Hill tribes Canarese is the colloquial. The Todars have a language peculiar to themselves, but they communicate with the Burgher and other tribes in Canarese. The Todar language has a singular accent, and a quaint original style, and seems to bear no analogy whatever to that spoken by any other race of natives in southern India. The Coorumburs have also a peculiar dialect of their own, but it seems to be based on the Canarese.

Condition. Under this head a very favorable report may be made, as, with the exception of the two inferior tribes, the Erulars and Coorumburs, who, from their improvident and vagrant mode of life, are often in a state of great destitution, all the Hill tribes live in comparative comfort and affluence. This is as to their physical condition; but in regard to their moral state the aspect is not so favorable. The accomplishments of reading and writing seem almost entirely unknown amongst them, while their morals are tainted by the arts of dissimulation, cunning, and falsehood, which seem to be instilled into their minds at an early age.

Superstitious to a degree almost incredible, and prejudiced against all innovation and improvement, I fear they offer but a barren field to the German missionaries who have established themselves on the Neilgherries to labour amongst the Hill tribes; and who are endeavouring to form village schools, in the hope of inducing parents to send their children to them for instruction in their own tongue.

Health and Diseases.

Upon this point it is not easy to obtain correct information, as all the natives have an insurmountable aversion to entering a hospital; and though they value and respect the opinion of a medical officer, they are not found to come voluntarily forward to seek assistance and advice. From observation in their villages, and of the coolies and others who come to the houses of European residents for employment, we are led to conclude that all classes of natives located on these Hills, whether of high or low caste, aborigines or modern settlers, enjoy the most robust health, showing that the pure atmosphere and invigorating climate have the same genial effect upon the Native, as upon the European frame and constitution. The most prevalent diseases amongst the Burghers, who may be considered the mass of the Hill population, are small pox, occasionally fever, and an affection of the eyes resembling ophthalmia.

Small Pox, a prevalent disease.

The first of these is however the only one which can be called common amongst them, and is the greatest scourge by which they are visited; and as vaccination is not practised, the disease often commits fearful ravages in their villages, carrying off whole families in a brief space of time. There is no doubt that the mountaineers would willingly take advantage of the existence of a Vaccine Depôt, if one were to be established on these Hills; and as the disease certainly seems local, and peculiarly virulent on them, and as it is totally impossible for the two medical officers stationed in Ootacamund, to quit the scene of their constant and extensive duty amongst the sick officers and their families resident there, to introduce and practise vaccination in the Burgher districts, it would be a great blessing to the district if such an institution could be formed in it, and be the means unquestionably of saving many lives.

Health and diseases of Troops, with the presumed causes of healthy or diseased state, and the treatment, (not strictly medical) found to be useful.

The impending measure for the location of European troops on these Hills will, it is to be hoped, before long, furnish striking and favorable evidence upon this subject. At present it can only be inferred that the beneficial and renovating effect,

which even a few months' residence on them produces on the enfeebled constitutions of officers, must in an equal degree be exerted on the condition of the private soldiers who may be sent to them; and that not only physically, but morally; since the constant out of doors employment and recreation which they would be enabled, during the greater portion of the year, to find and enjoy, would remove them from the influence of that most demoralizing of all agencies, the dull, monotonous irksomeness of the almost constant confinement to barracks, and of the life of utter idleness which they are compelled to in the plains. To the unfortunate wives and children of the European soldiery the effects of this wise measure will produce incalculable benefit, for it needs only to consult the tables of mortality in the records of almost any European regiment serving in the plains, to perceive, that upon them, and the latter especially, the hardships and sufferings of a barrack life there fall with aggravated cruelty. Under the discipline of a good school, and with constant employment found for them, relieved by the healthful exercise which will always be within their reach, it is not too much to say, that hundreds of lives may be annually saved, many too, possibly to be devoted to the service of the state, in the persons of useful and well educated servants. I think that on the first arrival of fresh troops on the Hills, much care and attention will be necessary to adapt the habits of the men to the entirely new climate (comparatively speaking) in which they will find themselves, avoiding very early and very late parades, and making all guards and sentries put on great-coats before sunset, and wear them till after sunrise, and generally keeping the men out of the influence of the night air as much as possible. The site which I have had occasion to recommend for the new cantonment, in the valley of Jakatulla, is situated at an elevation of 6,100 feet above the sea, and enjoys a most temperate and agreeable climate; but the rapid change of temperature which follows the withdrawal of the sun's rays there as in all other parts of the Hills, demands care and precaution, especially in the case of men whose constitutions, and liver especially, have become injured by long residence in the low country.

Men suffering from dysentery will, with care, do well in Jakatulla, at all events in the dry weather, if too much exposure to the sun and to the dry easterly winds is avoided. Indeed there appear to be few diseases contracted in the plains which are not, unless too far advanced, speedily cured here—speaking of the Hills generally—with the exception of liver complaint, which if abscess has already formed, usu-

ally assumes a more aggravated form through the cessation of the action of the skin, after a short residence, and compels the patient to proceed to sea as the only alternative.

Education and mode of pursuing it.

Amongst the Hill tribes it may be said that there is no education whatever. The German missionaries, referred to in a preceding section, are now endeavouring to establish schools amongst the Burghers, and to prevail upon the parents to send their children to them, but I believe with very indifferent success. They have so little ambition or desire to see their children rise beyond the position in which they are born, that reading and writing are looked upon as very unnecessary accomplishments; and as an illustration of this I may mention that a philanthropical gentleman who has settled on these Hills, and who devotes much of his time to the task of attempting the moral regeneration of the Burghers, is only able to draw children to a school which he has established, by the payment of 1 anna daily to each! The Kothers, Erulars and Coorumburs are all equally degraded in regard to education, or to the desire to acquire it, and with the Todars it is, of course, quite out of the question.

Amongst the native settlers from the plains the case is very different; in the settlement of Ootacamund there are five native schools, which are attended by many of the children whose parents can afford the small fee payable to the schoolmaster.

The instruction imparted in these schools is, of course, confined to reading, writing, and a sort of arithmetic.

European Schools.

There is also a very good school conducted by an European, for the education of the sons of Europeans and East Indians, which is supported by voluntary contributions; and is under the general superintendence of the chaplain of the station for the time being. It is situated in Ootacamund, where also two seminaries have been recently established for the children of the better class, one for boys and one for girls, both of which, I believe, are well supported, and prove of great advantage to officers and others, whose means will not admit of their sending their offspring to England, when they have attained the age beyond which it is considered unsafe to keep them in the plains.

Proposed Proprietary School.

It has been in contemplation to establish a proprietary school upon a large scale on these Hills, with a view to rendering the expense to

parents as small as possible, while, at the same time, the best system of education should be adopted in the establishment; but, owing to pecuniary difficulties, this excellent scheme remains for the present in abeyance.

Charitable Institutions. Excepting the Government hospital and the dispensary, there is no charitable institution, properly so called, on the Hills. There is an association amongst the European residents of the cantonment, for granting out-door relief to aged and indigent poor, who attend daily at the door of the church to receive it in the form of food, money, or clothing; but there is no establishment into which paupers are received and sheltered. The public choultry or caravanserai is intended more for the accommodation of travellers and market men from below, than for a refuge for the sick and poor.

The hospital is in charge of the senior medical officer, but, owing to the prejudice which exists amongst the natives against such an institution, a patient is very seldom received within its walls.

State of litigation and of crime. The most fruitful sources of litigation are disputes about boundaries of land, trespassing of cattle, and adverse claims to the right of water from particular channels.

These, especially in the cantonment, run very high at times; but it is to be hoped that the permanent fixing of all boundaries by means of the present survey, will put an end to these difficulties in a great measure.

Crime is certainly not common on these Hills; as beyond cases of petty theft, and these for the most part confined to the cantonment, the general criminal calendar is a very light one. Murders have been committed, and possibly are so still, at rare intervals, upon the persons of unfortunate Coorumburs, accused of witchcraft, both by Burghers and Todars; but as such deeds are generally massacres perpetrated by a whole village, it has frequently been found impossible to trace the actual murderers. Upon the whole it must be admitted, that in spite of their proneness to lying and dissimulation, all the tribes inhabiting these Hills are free from the stain of serious crimes. Drunkenness and violence are unknown amongst them, and in this respect they offer a striking contrast to the other native residents, who, both Malabars, Mysorians, and other emigrants from the

plains are much addicted to spirits, which are unfortunately to be obtained readily, and at a very low rate.

With regard to the cantonment of Ootacamund, when the peculiar nature of its native population is considered, consisting as it does of petty traders, Brinjarries, Lubbies, and servants of all castes, and from every part almost of India, combined with the means which all classes possess of obtaining arrack, and also opium, it must be esteemed very creditable to the authorities that so little crime is committed within its precincts.

That such should be the case is doubtless chiefly to be attributed to the constant presence of a magistrate (who is also commanding officer of the district) aided by a tahsildar and cutwall resident on the spot, around which the bazaars and abodes of the native inhabitants are drawn so closely, and so little scattered, as to bring them all readily within the range of a close surveillance.

Police; number, remuneration and efficiency.

Pay.	The Police of the Neilgherries consists of
Rs. 400 per mensem.	The Joint Magistrate.
„ 50 „ „	The Tahsildar, who is also " Head of Police."
„ 42 „ „	The Cutwall, whose duties are confined to Ootacamund.
„ 17 „ „	The Peishcar, or Tahsildar's deputy, who has charge of the eastern portion of the Hills.
„ 10½ (Cutwall's and „ 7 Sebundy)	5 Duffadars, and
5 ; 4 : and 3½ „	75 Peons.

But of these two last, 3 duffadars and 43 peons belong to the sebundy establishment, and are employed at the proper season in collecting the revenue. Six peons also are exclusively employed in the charge of the forests which are scattered about the environs of the cantonment, to prevent wood-cutters from wantonly destroying them, or cutting in parts where they are prohibited from felling trees. Besides these, 2 duffadars and 20 peons, under the immediate orders of the cutwall, remain in Ootacamund to carry on the police duties of the bazaars.

The orderly state of the chief settlement, Ootacamund, sufficiently attests the efficiency of the cantonment police, as does also the com-

parative absence of crime in the hill district generally, that of the Sebundy or rural police.

Manufactures.

There are no manufactures carried on on the Neilgherries, unless a few earthen pots made by the Kothers, and principally at a village near Soloor, to the westward of Mootenaad, may be called by that name. From the great command however of water power all over the Hills, and especially near the summits of the passes or ghauts, many of the products of the plains requiring to be wrought by heavy or steadily driven machinery, such as cotton for yarn, oil seeds, &c., might, no doubt, be profitably converted from the raw state on the Neilgherries, or on their lower slopes. The wheat raised on them might also be ground into flour by machinery turned by water, very economically ; and it seems strange that at the present time, although a large quantity of flour is consumed in the settlements, and considering how many Europeans who must have some knowledge of ordinary machinery are resident on the Hills, not one flour mill is in existence, all the wheat being ground by manual labour in the common ancient native mill of two circular stones, the lower fixed and the upper one revolving.

Capital employed.

No capital to any extent is invested at the present time except in mulberry and coffee plantations, the amount of which I have no means of ascertaining, and in house building in the cantonment, which is not considerable. The return on the latter investment appears to be about 15 per cent.

Imports.

The following articles are imported into the Hill district from the adjacent provinces of Malabar, Mysore, and Coimbatore :

Sugar,	Turmeric,	Oils,	Arrack,
Salt-fish,	Cocoanuts,	Almonds,	Dried Fruits,
Sheep,	Bullocks,	Poultry,	Gunpowder,
Sulphur,	Lime,	Furniture,	Artificer's Tools,
Gram,	Raggee,	Chollum,	Betel Nut,
Ghee,	Spices,	Limes,	Native Peas,
Cotton Cloth,	Salt,	Tobacco,	

and of European articles : wines and spirits, wearing apparel, cambrics, woollens, flannels, muslins, shoes, books and stationery, earthenware and glass, hardware, groceries, beer and porter, candles, and all kinds of supplies for the table.

To this list, strange to say, is to be added wheat, which is imported to some extent from Mysore, where it is cultivated on the higher steppes of the table land. The bakers buy it because it is cheaper than the Hill wheat, although not nearly so good, and mixing it with the corn purchased from the Burghers, turn it to profitable account. There is generally a difference of 3 to 4 seers per rupee in the prices of the Mysore and of the Hill wheat, in favor of the former, in spite of the extra cost of transit to the cantonment market up the Seegoor ghaut, a circumstance which tends to support the idea of the misappropriation and mismanagement of this district through the ignorance and apathy of the Hill cultivators.

Exports.

The exported articles are coffee, silk, potatoes, barley, hides, opium, wax, dammer or resin, and wheat, which being bartered by the Burghers for low country necessaries with the itinerant traders, thus becomes an article both of import and export.

No statement can be furnished of the quantities of the above mentioned goods which are imported or exported, since in consequence of the transit duties having been abolished, they pass through no office in which their amount might be registered.

Exchange.

Money is readily obtainable for bills on Bombay or Madras from the native merchants, who, having disposed of their goods on the Hills, are anxious to remit the proceeds for re-investment. Hence cash on such bills is generally obtained at par, or at the utmost at 1 per cent. discount. No other exchange operations are carried on in the settlement, all business with England being transacted through agents at Madras or Bombay.

Weights.

The weights in use in the bazaars of the three settlements are: The maund of 25 lbs. avoirdupois.
,, viss ,, 2 ,, ,,
,, pound of 40 Rs. or tolas weight.
,, seer ,, 25 ,, ,, ,,

The Burghers sell all their produce by measure, excepting opium, which they rate at so much per seer of 24 rupees weight, being one rupee under the seer of the bazaars.

Measures.

The bazaar measures are the seer, ½ seer, and ¼ seer, in use all over the country. The Bur-

ghers sell their grain by the "kolagum" the contents of which when heaped up is about 226 cubic inches, or somewhat more than 2 seers.

Coins.

The coins issued from the Honorable Company's mint are the only monies in circulation on the Hills, viz., rupees, half and quarter rupees, 2 annas, quarter and half annas, and pice.

It is supposed that a good deal of coin goes out of circulation in the district, owing to the Burghers and others either hoarding it by burying, or getting it converted into ornaments.

Banking operations.

A bank was recently established in Ootacamund, but it failed in consequence, I believe, of the ignorance and want of standing of the managers. But considering that there is almost always a large community of Europeans, chiefly in the service of Government, congregated at the station, together with a not inconsiderable number of native traders possessed of capital, it seems obvious that if conducted upon proper principles, and by parties of mercantile respectability and intelligence, such an establishment could not fail to prosper, and to prove a source of great convenience and benefit to the public.

Lending and Borrowing.

Money is lent in the bazaar amongst the natives at the usual usurious rate of interest: 2 per cent. being given for loans with security of jewels or other convertible property, per month, and 3 per cent. per month for money lent on personal security only.

Modes of transit and communication.

The Neilgherry district communicates with the neighbouring provinces by means of six passes or ghauts, the roads in which have been cut and kept in repair at the public expense, with the exception of one, the "Manaar" or "Soondaputty" ghaut which has gone out of general use. The only one of these passes which is ascended by wheeled conveyances is the "Seegoor;" the mode of transit on all the others being by bullocks, coolies, and, to a small extent, by asses. By the "Seegoor" ghaut however, cart loads of 1,000 lbs. weight, or 2 candies, are brought up, an additional pair of bullocks being required to help the cart over the steepest parts of the ascent.

The Goodaloor Pass.

Commencing at the N. W. angle of the plateau the first pass which presents itself is that

leading from Neddiwuttum to Goodaloor forming the communication between the Hills and Cannanore, Tellicherry and the western coast towards Bombay through the Wynaad country, and also with Calicut by the most direct road which exists to that city; descending the Carcoor pass, and passing through Nellumboor parallel to the Beypoor river to the coast. The "Koondah Ghaut," having however obtained a preference over this line for the journey to Calicut, the tappal runners have lately been taken off it and posted along the other; in consequence of which the ferries, by which several large streams are crossed, are not now regularly attended, and, through the absence of a constant and sustained traffic along the line, the jungle is encroaching and becoming rank and dangerous, both from malaria and beasts of prey. The public bungalows also along this line are badly situated as regards health; but this I understand will before long be obviated by the erection of a new one in an open space clear of the encroachments of the jungle, and free from fever. It is much to be regretted that this road should be allowed to fall into disuse as the line is a most convenient one for reaching the Hills from the coast by Calicut where all invalids from Bombay now land; and as the ghaut, being a short one of only 5½ miles, and on a very good trace, can be easily and economically kept in repair.

The Rajah of Nellumboor is, I believe, bound to keep up the ferries between the town of that name, and the foot of the Carcoor pass, so that the expense of keeping this line of road open would fall very lightly upon Government. The road on from Neddiwuttum into Ootacamund is an excellent one, and has been recently repaired throughout, so as to be perfectly practicable for laden carts. The ghaut is also in good order and a laden bandy can descend it with safety; but the ascent is impracticable in consequence of some very steep acclivities upon which the road is carried. The Pykara or Moyaar river forming the boundary between the districts of Malabar and Coimbatore, the road from thence to the westward is under the collector of the former province, by whom the greatest attention appears to be given to it.

The Seegoor Pass. This ghaut which is the most frequented of all, in consequence of its being practicable for laden carts and other wheeled conveyances, is carried down the northern face of the Hills, commencing the descent near Mootenaad, and ending it near the village of "Seegoor." By this pass the communica-

tion is kept up with Bangalore, Madras and all places to the northward, and the chief bulk of European supplies, heavy baggage, horse gram, rice, &c., comes to the settlement by it. It also affords the means of transit for the teak timber used on the Hills in the form of rafters, planks, &c., the road passing near the forests where teak trees are cut under sanction of Government, about Tippacadoo and Musneumcoil. The trees are felled by Coorumburs and others, and are then, after being lopped and roughly dressed, dragged on rude bandies by buffaloes to the road side, where they are sawn into building pieces, and sent on bullock bandies to the Ootacamund market by the Seegoor Ghaut.

The Kotergherry Pass. In the north-east angle of the plateau of the Hills, at Kotergherry is another ghaut communicating with Matepolliem in the low country, and thence to Coimbatore and the Salem road.

This is the oldest road cut for the ascent of the Neilgherries at the expense of Government, and it led formerly to the original sanitarium at Dimhutty. It has been constructed in a very sound and substantial manner originally, but having been neglected and suffered to fall into very bad order, it was found necessary last year to give it extensive repair throughout, owing to which it is now in a very practicable state, though too steep for wheeled carriages.

This, and all the other ghauts, could be kept in repair at a very trifling expense, if some person were entertained, whose duty it should be to go down the entire line once a month with coolies, to see that no drains or channels had got choked ; for the interruption of one of these outlets for the heavy falls of rain which now and then occur, and which might, if remedied in time, be done by one man in an hour often causes breaches in the road which it takes twenty or thirty men to repair. This ghaut is of considerable importance to the eastern, part of the Hills, as a great deal of traffic in the produce of the coffee plantations and of the Burghers' lands goes on by it; and large quantities of low country goods are brought up it for sale and barter. It is also favorably situated for gaining the summit of the Hills on the eastern side, as the ascent of a long spur on which the lower part of the road is carried, is commenced almost immediately after quitting Matepolliem, without having to pass through much low jungle.

Troops therefore marching to the Hill cantonment could, by leaving their camp at Matepolliem at daybreak, ascend into a cool climate before the sun was high enough to distress them.

The Coonoor Ghaut.

The Coonoor ghaut on the other hand, which is the next to the eastward, does not commence its ascent until after 7 miles of bad jungle have been passed through after leaving Matepolliem. It is however the most frequented by travellers in palanquins and on horseback, as the road on from the summit at the settlement of Coonoor leads more direct from Ootacamund than that from Kotergherry, besides having the advantage of a public bungalow conveniently situated near Coonoor, while at Kotergherry there is none. The Coonoor ghaut has been very well constructed, especially the lower half of it, which could be ascended by laden carts having an extra pair of bullocks. The upper part has not been so well traced, the gradients being less favorable, and irregularly arranged. There is an immense traffic on this ghaut entirely by bullocks, which ascend it by thousands on the Ootacamund market day, and indeed almost daily, laden with every description of low country produce and other supplies. Travellers from Madras and the South almost invariably come by this road as the journey from the east coast by Salem is both the most easy, and occupies less time than by Bangalore and Seegoor.

The Mailoor Ghaut.

The Mailoor or Soondaputty ghaut appears in former years to have been much frequented, by travellers journeying from the eastern parts of the presidency by Coimbatore to the Hills, from which town there was a road to Soondaputty, a village at the foot of the southern part of the Neilgherries, though what the direction of it was I am unable to say, as the country between Coimbatore and that part of the base of the Hills appears never to have been surveyed, and is left blank in the Atlas of India. This ghaut which gains the summit of the Hills near "Shoondabetta" is only now used by smugglers and by the Burghers who cultivate land about Mailoor and Keel Koondah, to carry down their produce for barter for clothes, tobacco, salt, &c. The remains of a very good road still exist from the top of this ghaut all the way to Ootacamund, but it has become impassable in many places, owing to bogs having formed in the hollows and closed over it.

The Sispara or Koondah Ghaut.

This magnificent ghaut forms the line of communication between the western coast (Calicut) and the Neilgherries, across the "Koondah" mountains. Viewing this latter tract as one likely to become, before long, of the greatest value and importance as a producing country, I should describe the

Sispara pass as one to which attention should be particularly drawn. Since however the survey of the "Koondahs" has not yet been executed, it will be proper to defer a description of it and of the public buildings and bridges which have been lately erected along the line of road by which Ootacamund is approached from its summit, until it can be introduced into the "Memoir" prepared to accompany the map of that part of the Hill district, together with a table of roads and distances from the nearest halting places in the plains at the foot of the respective ghauts.

Communication by water.

None, internal, or, naturally, with any other district.

Impediments and their duration.

Impediments very rarely occur on any of the lines of communication to the Hills. Sometimes in seasons of long continued rain masses of overhanging rock, getting loosened by the washing away of the soil beneath, fall upon the road and cause some inconvenience, but never to the extent of suspending the traffic upon any of the ghauts. The most serious impediments have been occasioned by the washing away of the bridges near the foot of the passes, as at Tippacadoo near Seegoor, and Matepolliem, during the past year. But a temporary remedy being at hand, only a brief suspension took place in the transit of goods along those lines of road. Along the lines of road on the plateau diverging from Ootacamund to the summits of the various passes, impediments more frequently occur, owing to the perishable nature of the timber with which small bridges are constructed to carry the road over channels, and to the sinking of the rough stone causeways laid across swamps. By degrees however a better system is being introduced, and more permanent works are now taking the place of these temporary and inefficient structures. It is unwise, and I think bad economy, to construct any road bridges on these Hills of jungle wood, unless it has been cut long before it is required for use, and thoroughly seasoned, as the alternations of heat and cold are so very extreme, and the changes of weather from dryness to moisture so continuous, that the fibres of unseasoned wood soon yield to their influence. Only teak beams should be used, unless jungle wood can be cut and kept to season for use in convenient situations, or unless a brick arch is not considered expedient.

Fords.

Fords are numerous on the Hills, but are all insignificant, as being merely the crossings of

small streams, except near Pykara where there is a good ford across the Moyaar, over a dyke of trap rock which runs at right angles to the course of the stream.

Ferries.

The only ferry on the Hills is that near the public bungalow at Pykara, for carrying the road to Neddiwuttum across the Moyaar. It is used by travellers in palanquins and on horseback, as also by carts; but the ford, which is close by, affords the readiest means of crossing to foot passengers. The ferry boat which consists of a platform laid on two canoes or barges, and is moved by hauling on a cable of twisted rattan stretched from bank to bank, is the property of Government, and two ferry men to work it are maintained at the public expense, receiving 6 rupees each per mensem. No toll is levied on passengers making use of it.

Bridges.

There is a substantial brick bridge at Coonoor crossing the great stream which descends the pass at that place; another on the Neddiwuttum road about half way between Ootacamund and Pykara; one at Ootacamund connecting the extremities of embankments run out from bank to bank of the lake to form a road across it; and another at the entrance of the cantonment by the Coonoor road over the stream which feeds the lake. These bridges are all single arched, but the span is inconsiderable, and they are not worthy of more particular description. Two large and substantial timber bridges have been recently constructed on the Koondah road, one over the principal feeder of the Bowany (called by the Burghers the "Porthy" or "Porutty" river) and the other at the entrance of the "long valley" on the Koondahs, which, together with the bridges which occur along the Sispara pass, will be described in the Koondah memoir.

There are innumerable small jungle wood bridges upon all the lines of road over petty streams and nullahs, which do not demand particular description.

Revenue derived from Post Office, Rupees 13,000.

The net revenue of the post office for the year ending 31st December, 1847, after deducting abstracts for the year amounted to rupees 12,953-12-5.

Taxation.

In addition to the land tax or assessment already fully described in the Table at page 26, the quit rent on lands held by Europeans, and the tax on the Todars, buffaloes, described at page 56, may be enumerated the excise or tax on arrack, sold on the Hills, which is collected by farming out the

monopoly of the right of selling the spirit, as is customary in all districts under this presidency; and the "Koopoovery" a municipal tax levied by the cutwal on all householders in the bazaars of the cantonment for the maintenance of a department of scavengers, &c., for keeping the streets clean. The following is a statement showing the gross amount of revenue derived from each source referred to in the Memoir, in 1847, viz.—*For the Coimbatore Talook of the Neilgherries.*

Sources of Revenue and produce of each tax.	Fusly 1256 or A. D. 1846--7.		
		Assessment in lands from Burghers, &c. including Todar's buffalo tax and Pullooverry, and quit rent on lands of Europeans............Rs.	7,820
		Arrack contract, sold for.......... ,,	16,300
		Koopooverry or scavengers' tax surplus after expenses............ ,,	300
		Rent of a shop in the bazaar belonging to Government............ ,,	24
		Fines levied in the Police Court.... ,,	875
		Stamped paper and transfers...... ,,	126
		Post Office revenue.............. ,,	12,953
		District postage realized......... ,,	164
		For the Coimbatore portion—Total Revenue..Rs.	38,562*

The revenue derived from the Malabar, or Western portion of the Neilgherries amounted to about 700 Rupees.†

Total expenditure on account of charges, per mensem.. Rs. 2,089-4

Mode of collection.

The land tax or assessment on cultivated lands is collected by the tahsildar and peishcar who make a progress through their respective divisions, accompanied by the ghomastahs and sebundy peons, and collect it according to the rate fixed by the ghomastahs on inspection of the state of the crops on the land. The excise duty on arrack is collected by a sale of the privilege to one individual, from whom the amount is received without further trouble to the government functionaries. The quit rent is collected upon bills sent to each landholder signed by the collector, and the amount received by the ghomastahs who attend with the document. The "Koopooverry" is collected by the cutwall as already stated. All fines levied for misdemeanor in the tahsildar's or ma-

* Vide appendix A.

† The amount in 1243 Fusly or A. D. 1843-4 was Rs. 649-3-2.

gistrate's court, are paid into the talook treasury. The receipts of the post office, after deducting the amount of the monthly abstract for the pay of the office establishment, are paid into the talook treasury.

The district postage is received from parties sending letters to Seegoor and other places in the talook, to which no regular mail is sent from the post office.

The Principal Collector visits the district once a year on "Jummabundy," when the revenue accounts are settled for the past year, and all complaints of over assessment examined into and adjudicated.

Number in Sebundy or other Corps engaged in collecting Revenue.

The total number of peons employed in the collection of the revenue is 43, with 3 duffadars and 3 ghomastahs; the peons and duffadars are also available for general police duties under the orders of the tahsildar, who, next to the Joint Magistrate, is the head police officer of the Hill district.

History: and Antiquities.

The utmost obscurity hangs over the early history of the Neilgherry Hills, for beyond the period of the immigration of the "Todars" or "Todawars," tradition amongst the present inhabitants, affords no clue whatever to trace it. That they have been in former ages inhabited, and that by a very peculiar race, evidence sufficient to show is furnished by the existence of the numerous "cairns," or rude tombs found upon the summits of almost all the loftier mountains in every part of the Hills, the origin of which is so remote, that the Todars, recognized as the most ancient inhabitants, have no tradition amongst themselves bequeathed by their ancestors, which even guides us to a surmise, as to the race of people by whom they were constructed. As affording thus almost the only land marks, by which speculation as to the ancient state of this remarkable region can be guided, these "cairns" seem to merit a brief description. They are invariably situated, as has been already mentioned, on the highest summits of the Hills, sometimes single, but more frequently in groups or rows of from 3 to 6. They are circular in form, raised with large unhewn blocks of stone 4 feet or more above the level of the ground, and varying in diameter from 12 or 15 feet to 25 or 30. The interior is hollowed out to some

Cairns.

depth below the original surface, usually until the solid rock is reached, and the space thus cleared filled with earthen pots, with the covers strongly luted on, pieces of bone, charcoal, and fragments of pottery, all tightly packed in a soil so black and finely pulverized, as to give cause to suppose it to be de-

composed animal matter. On breaking these pots or urns, which many of them are in the form of, they are found to contain ashes, charcoal, and pieces of half calcined bones; with sometimes a small quantity of a pure scentless fluid, which in two instances I found to be pure water slightly impregnated with lime. Images of tigers, elks, bisons, leopards and some domestic animals, pieces of half decomposed bronze resembling spear heads, tripods, &c., are also found occasionally, mixed with the other remains; but it is a singular fact that on breaking up the strong pavement of slabs of stone, with which the cairns are covered in, and mining down until a second pavement is come upon, which, from its tightness and weight has, to all appearance, never been disturbed since it was first laid, we find on removing it that the contents of the vault below, instead of being laid in the order befitting the repose of consecrated ashes, are generally smashed and broken up and mixed with the soil, leaving barely one or two pots of bones and ashes entire, just as though the pickaxe of the destroying explorer had been already there. Some ingenious writers have endeavoured to build up upon the evidence of these cairns a theory, to the effect that their constructors must have been a tribe of the ancient Scythians, who having wandered into this remote part of Asia, preferred a settlement on the Hills they had discovered, to the hopeless undertaking of a return; and pursuing their hypothesis, and discovering instances in the customs and habits of the present Todars, which assimilate them to the race which history describes under the name of Scythians, they pass on to the conclusion that their ancestors were the founders of these tombs, and the descendants of the ancient Scythians. But this assumption is in my opinion erroneous. So prejudiced and bigoted a race as the Todars would naturally cherish with the utmost veneration and solicitude any vestiges of mortality, which their most vague tradition should point to as monuments of their ancestors; and therefore when we find them offering not the slightest objection to the cairns being broken open and their contents rifled, and even voluntarily guiding strangers to unexplored ones, aiding them in the work of destruction, it is reasonable to conclude that they form no link of communication between the present race of Todars, and any tribe of people by whom these singular monuments may have been raised.

Todars believed by some to be descendants of the ancient Scythians.

Cairns afford no clue to the History of the Todars.

All clue being thus lost, it would be idle to follow out further any speculation as to the history of the Neilgherries prior to the first

coming to them of the Todars, for as no coins or inscriptions or even hieroglyphics have been found in any of the cairns, or on their contents, there exists no evidence whatever by which inquiry could be guided into the right course.

With the Todars then commences the only (partially) known history of the Neilgherries.

At the time of their immigrating, they probably found no aboriginal inhabitants settled on them, and seeing, in the solitary and inaccessible character of the mountain region which they had discovered, a fitting spot for the undisturbed exercise of their singular religion, and peculiar pastoral habits—for the former of which they had possibly endured persecution amongst the tribes of the plains—they determined on permanently occupying it. Ages, according to their belief, must have passed while they remained in undisturbed possession of the Hills, extending over such a space of time, that they express their belief that the founders of their tribe were created on them; until at length a small band of Kothers found their way up from the plains, and besought permission to till certain tracts of land which they indicated. From this era may be said to have commenced the self arrogated sovereignty of the Todars over the land forming the plateau of the Neilgherries, as, conceding the privilege sought for by the new comers, they stipulated that a certain proportion of all the grains which they might produce from the soil, should be annually presented to them as "goodoo" or tribute, in acknowledgement of their feudal right over the territory. Not long after this, and according to their traditions, 3 or 4 centuries ago, a party of "Burghers," or "Buddughurs" emigrated from the "North country," (probably the Northern part of Mysore and Canara,) and came to the Neilgherries; and being good cultivators, at once perceived the advantages offered to them in the virgin and rich soil which they saw on all sides. They accordingly appear to have obtained permission to settle and cultivate land, upon the same terms as those granted to the Kothers, and inviting more of their brethren to join them, they soon swelled into a numerous tribe and spread over the Hills, constructing their villages, and enclosing their fields (and doubtless clearing away much forest) in all directions. I can find no evidence of any sovereign ruler having been acknowledged amongst the Hill people, until about a century before the reign of Hyder Ally in Mysore, when according to the tales of the Kothers and Burghers, there were 3 princes or chiefs who had sway over them, one in Todanaad who resided in a fortress called Mullaycotta, the walls and ditch of which still exist on a Hill to the eastward of the village of

The coming of the Kothers to the Hills.

The coming of the Burghers.

The 3 princes or chiefs of the Neilgherries.

"Shoolooroo," and westward of Mootenaad and the Seegoor pass, (vide B sheet of Map); one in Meykenaad in the fortress, the ruins of which are now called "Hoolicul Droog" situated on a lofty ridge overlooking the Coonoor pass, and a third in Parungenaad in a fort the site of which is still pointed out near Kotergherry and called "Konagerry," though no vestige of a fort remains now recognizable. Their traditions state that at this time, in consequence of disputes between the Burghers and Kothers regarding their respective boundaries, a general settlement of their lands took place under the auspices of the three chiefs, when the lines of demarcation were definitively fixed; and though only by oral indication, in consequence of the ignorance of reading and writing which then, as now, prevailed, the limits of the territory of each tribe were so distinctly identified, that ever since, up to the present time, no disputes about them have ever been known to occur.

Hyder Ally lays the Hill people under contribution.

What became of these three chiefs cannot be guessed from their traditions: but it seems probable, that Hyder Ally, having sent emissaries to lay the Hill people under contribution, had his attention called to the value of the territory, both as a producing district and as a strong post, from which he might harass his enemies in Malayalum and Coimbatore. He accordingly appears to have seized upon two of the three forts which commanded the passes to those countries, viz., Hoolicul Droog and Mullaycotta, and having deepened their ditches, heightened their walls, and otherwise strengthened them, he put strong garrisons into them, which both controlled the Hill tribes, and observed and harrassed the kingdoms below them. This tradition is borne out by the present appearance of these two forts, which although partially ruinous, yet retain sufficient evidence of comparatively modern occupation, while the third (Konagerry) has become entirely obliterated.

Taxation by Hyder.

With Hyder the system of taxation must first have commenced on the Hills, and the imposts levied, both by him and by his son Tippoo, on the mountaineers, must have been very severe. Old inhabitants, who have a clear recollection of those times through the tales of their fathers, and an imperfect one through their own retrospect, state that whole villages used to be despoiled of their year's grain and fodder by Hyder's officers, who made incursions continually amongst them, and forced the villagers to carry their own plundered property down the face of the Hills to Danaikencotta, where the Mysoreans had a strong fort and an extensive magazine. Hence to the Hill tribes the overthrow of Tippoo, and the transfer of their territory to the East India Company,

was a change fraught with the most beneficial results; and I imagine the tranquillity and security, which they have ever since enjoyed, have rendered these people a portion of the most contented of the host who now acknowledge the Honorable Company's sway. With the

Public Buildings.

exception of the buildings erected along the various lines of road for the accommodation of travellers, the public buildings of this district are chiefly congregated within the limits of the cantonment of Ootacamund. They consist of

A Public Office—containing the Magistrate's and Commanding Officer's establishments; the Pay Office, Post Office, and rooms for the security of property in the charge of the Magistrate and Commanding Officer.

A substantially built Church, with burial-ground.

A commodious Dispensary.

A Jail, so called, from convicts, employed on the roads, having been quartered in the sheds attached to the building: at present unappropriated.

A Choultry situated near the main bazaar, for the accommodation of native travellers.

A Kharkhana, or building for housing Government cattle employed on the roads: the establishment for this purpose costing Rupees 56-12 per mensem.

A Cutwall's Choultry for police purposes.

A Tahsildar's Cutcherry.

A Meteorological Observatory on the summit of Dodabetta, erected at the expense of Government.

Traveller's Bungalows at Pykara, Neddiwuttum, Kulhutty, and Coonoor; one at the foot of the Koondahs called the "Avalanche;" and one at the summit of the Koondahs at Sispara.

Chettrums for natives at Nunjanaad, Coonoor, Avalanche, Sispara, Koondahs in the long valley, Wallakadoo in the Sispara pass, the Kaitee valley, Berliar in the Coonoor pass, and at Kulhutty Seegoor pass.

These Chettrums are almost all new buildings with substantial walls, roofs of tiles, and doors and windows; but so singular are the ideas of natives regarding accommodation for themselves, that they prefer passing the night in little thatched huts built by wayfarers, and seldom use the Chettrums, except to cook their food in. The bridges have been already enumerated under the proper head.

KOTERGHERRY,
NEILGHERRY HILLS,
29*th February*, 1848.

J. OUCHTERLONY, Captain,
Superintendent Neilgherry Survey.

Statement of the Population of the Cantonment of Ootacamund, (Natives.)

	Tamil.	Name of Caste.	Adults.		Children.		Remarks.
			Male.	Female.	Male.	Female.	
Main Bazaar.	வெள்ளாழர்	Vellaulers..........	137	144	88	84	Bricklayers, butlers, &c.
	வெள்ளாழமுதலிகள்	Vellauler Moodeliars..	17	18	4	5	Do. do.
	ரசபுத்தூரர்கள்	Rajpoots............	11	11	7	7	Venders of sweetmeats.
	மருட்டியர்கள்	Mahrattas..........	60	52	26	34	Tailors.
	ஆண்டிகள்........	Aandies............	10	0	0	0	Cloth merchants.
	ளாடகசாய்கள்....	Lodakaseys.........	29	27	18	19	Mutton butchers.
	தாசிகள்..........	Dancing caste.......	18	37	2	3	Dancing girls and players.
	கம்மாளர்........	Kummaulers.........	59	57	30	28	Goldsmiths, ironsmiths, carpenters, &c.
	செட்டிகள்........	Chetties............	17	8	5	3	Merchants.
	கோமட்டிகள்......	Comaties...........	4	0	0	0	Do.
	துலுக்கர்கள்.......	Mussulmauns........	142	151	124	118	Butchers, timber dealers, peons, shopkeepers, &c.
	செட்டிகள்.......	Saides do..........	25	7	3	2	Bombay hawkers, or itinerant merchants.
	பாரீஷ்கள்.........	Parsees	1	1	1	1	Bakers.
	லப்பைகள்.........	Lubbies............	152	18	8	9	Bazaarmen and traders.
	அம்மட்டர்கள்.....	Barbers............	18	16	8	7	Barbers.
	பள்ளர்கள்........	Pullers............	22	24	14	7	Hunters or shikanees.
	பறயர்கள்........	Madras Pariahs......	196	233	120	106	Cooks, horsekeepers, maties, &c.
	சங்குப்பறயகள்....	Chungoo do.	117	86	59	44	Coolies for carrying loads.
	தீயர்கள்..........	Teayers do.	1	1	0	0	Malayalum men.
	போட்டகீகள்.....	Portuguese.........	7	6	3	2	
	தோட்டிகள்	Toties, Pariahs......	46	36	18	22	Scavengers.

Uggrarum.	பிருமணத்கள்.....	Brahmins..........	25	16	6	5	Chiefly in the public offices.
	கவரேகள்.........	Gentoos...........	6	5	2	1	Do. and servants.
	மருட்டியபத்கள்....	Maharattas.........	2	0	0	0	Tailors.
	கம்மாளத்கள்......	Cummaulers........	3	2	2	2	
		East Indians........	2	1			
		Total...	1127	957	548	509	

Houses.				Cattle, &c.								
Tiled houses.	Thatched houses.	Tiled shops.	Thatched shops.	Bullocks.	Cows.	Calves.	Buffaloes.	Calves.	Bandies.	Horses.	Schools.	Mosques and Temples.
189	454	120	5	24	15	7	0	0	10	9	2	3

Native Population of Ootacamund, &c. (continued.)

	Tamil.	Name of Caste.	Adults.		Children.		Remarks.
			Male.	Female.	Male.	Female.	
Ottey, (site of former Otteyka-Mund.)	வெள்ளாழர்கள்	Vellaulers	19	16	8	6	Bricklayers, &c.
	கவரேகள்	Gentoos	16	19	6	11	Carpenters, gardeners, &c.
	மராட்டியற்கள்	Maharattas	2	0	0	0	Tailors, peons.
	கெங்கிடகாரகன்னடிகள்	Gengeda Kunawadies.	25	18	8	10	Coolies, working in gardens, &c.
	ஒக்கிலிகர்	Okeleyar	3	3	1	2	Do. do.
	தொரயர்கள்	Toreyoor	6	4	5	3	Do. do.
	கம்மாளர்கள்	Kummaulers	5	0	0	0	Smiths, carpenters, &c.
	துலுக்கர்கள்	Mussulmauns	4	5	3	4	Peons, gardeners, &c.
	சாணூர்கள்	Sanaars	2	2	2	3	Toddy dealers.
	தீயற்கள்	Teahers	3	2	1	2	Malayalum.
	பறயற்கள்	Madras Pariahs	49	58	25	19	Cooks and servants, horsekeepers, &c.
	சங்குப்பறயற்கள்	Chungoo do.	20	14	21	10	Coolies.
	சக்கிலிகள்	Chucklers do.	7	7	6	3	0 | 111 | 0 | 1 | 6 | 54 | 19 | 4 | 1 | 2 | 0 | 1 | 0
Codeappa's garden.	கெங்கிடகாரகன்னடியற்க	Gungadee Kunnadies.	22	24	18	14	
	கன்னடிவண்ணூர்	Kunnady Washermen	1	1	0	1	
	பறகன்னடியற்கள்	Pariah Kunnadies	6	3	2	3	0 | 32 | 0 | 0 | 4 | 92 | 28 | 20 | 6 | 0 | 0 | 0 | 0
Bandy soley.	கெங்கிடகாரகன்னடியர்	Gungadee Kunnadies	39	29	23	17	
	பறகன்னடியர்கள்	Pariah Kunnadies	11	6	4	6	
	பறயற்கள்	Madras Pariahs	50	56	28	33	
	சங்குப்பறயர்கள்	Chungoo do.	18	11	6	6	0 | 71 | 0 | 0 | 6 | 38 | 11 | 6 | 1 | 0 | 0 | 0 | 0
		Total...	308	278	167	153	0 | 214 | 0 | 1 | 16 | 184 | 58 | 30 | 8 | 2 | 0 | 1 | 0

Caundel Bazar.	வெள்ளாளர்கள்	Vellaulers	105	84	43	62	Vide the other side.
	கவரேகள்	Gentoos	45	36	11	21	Do.
	கைக்கோளயர்கள்	Kaikolars	2	4	3	2	Married dancing caste.
	கம்மாளர்கள்	Kummaulers	9	9	9	7	Vide the other side.
	ரசபுத்திரர்கள்	Rajpoots	3	1	1	1	Do.
	வெள்ளாழயெடையர்	Vellaulers Edears	2	3	1	1	Do.
	தெலுங்குபோய்கள்	Telugoo Bearers	28	9	6	5	Do.
	கெங்கிடகாரகன்னடியர்	Gungadee Kunnadies	24	13	5	9	Do.
	துலுக்கர்கள்	Mussulmauns	10	11	7	9	Do.
	அம்பட்டர்கள்	Barbers	21	15	10	8	Do.
	வண்ணர்கள்	Washermen	34	38	19	28	Do.
	வஷ்ட்டுணுவர்கள்	Vastoonoovurgul	3	0	0	0	Professional beggars.
	வள்ளுவர்கள்	Valloovurgul	3	0	0	0	Do.
	தாசிரிகள்	Daseenee	2	0	0	0	Do.
	வாடக்கசாய்கள்	Ladakasars	4	3	2	2	Vide the other side.
	வாணியற்கள்	Vunneyars	3	3	2	2	Do.
	பறயற்கள்	Madras Pariahs	118	129	84	93	Do.
	பறவண்ணர்கள்	Washermen do.	6	7	9	8	Do.
	சங்குப்பறயற்கள்	Chungoo do.	50	32	18	6	Do.
	பறகன்னடியர்கள்	Kunnady do.	136	104	68	73	Do.
	தெலுங்குப்பறயர்கள்	Telugoo do.	11	6	3	5	Do.
	சக்கிலிகள்	Chucklers do.	26	28	21	15	Do.
	கன்னடிசக்கிலிகள்	Kunnady chucklers	16	13	13	14	Do.
	பள்ளர்கள்	Pullers	32	24	11	19	Do.
	தோட்டிகள்	Toties	6	4	2	2	Do.
	போட்டகிகள்	Portuguese	2	1	2	2	Do.
		Total	701	577	350	394	

Tiled houses.	Thatched houses.	Tiled shops.	Thatched shops.	Bul-locks.	Cows.	Calves.	Buffa-loes.	Calves.	Asses.	Bandies.	Horses.	Temples.	Schools.
8	480	1	13	159	11	4	2	1	5	12	11	2	1

Native Population of Ootacamund, &c. (continued.)

	Tamil.	Name of Caste.	Adults.		Children.		Tiled houses.	Thatched houses.	Tiled shops.	Thatched shops.	Bullocks.	Cows.	Calves.	Buffaloes.	Calves.	Asses.	Bandies.	Horses.	Temples.	Schools.
			Male.	Female.	Male.	Female.														
Vunnar-pett.	வெள்ளாழர்.	Vellaulers.	5	5	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	வண்ணாரபறயர்கள்.	Washermen	16	14	11	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	பறயற்கள்	Pariahs.	17	16	13	11	0	36	0	0	4	1	0	0	0	0	0	0	0	1
Otooput-trey.	வெள்ளாழர்.	Vellaulers.	6	6	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	சங்குப்பறயற்கள்.	Chungoo Pariahs.	5	2	1	1	0	5	0	2	1	8	3	1	0	0	0	0	0	0
Uttacara Teeravoo.	துலுக்கர்	Mussulmauns.	7	5	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	பறயற்.	Pariahs.	17	10	9	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ரொட்டிகள்.	Reddies.	1	3	0	0	0	25	0	0	8	0	0	0	0	0	4	0	0	0
Munjana-coray.	வெள்ளாழர்.	Vellaulers	11	9	10	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	வண்ணார்.	Washermen.	3	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	பறயற்.	Pariahs.	5	4	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	சங்குப்பறயற்	Chungoo Pariahs.	9	7	3	4	0	26	0	0	0	9	4	2	1	0	0	0	0	0

Yeddey Theravoo.	யேனடயற்கள்	Yendears	45	56	20	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	கம்மாளற்............	Kummaulers......	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	வள்ளுவபண்டாரம்	Vullavoo pundaram	4	5	3	3	0	50	0	0	10	60	20	120	42	0	4	0	0	0
	KOTERGHERRY	All Castes.........	120	115	53	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	COONOOR BAZAAR......	Do.	139	134	60	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ARAVUNGAAD Do.*....	Do.	9	10	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Total....	420	405	207	181	0	142	0	2	23	78	27	123	43	0	8	0	0	1

* In the Valley called Sappers' Camp between Kaitee and Coonoor.

Census of the Population of the Neilgherry Hills, taken to the 1st of December, 1847.

To which is appended a statement of the number of dwelling houses, temples, cattle, ploughs, &c. belonging to each Village with general explanatory remarks.

THE TODAS.

Particulars of Toda-munds in the "Toda-naad" Division of the Neilgherries.

Number.	Name of Mund.		Adults		Children.		Buffaloes.		Calves.		No. of Huts.	No. of Temples.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
	English.	Tamil.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.					
1	Tharnadoo.	தார்நாடு...........	3	2	2	5	6	86	4	12	3	1	1	1	
2	Beyvermund........	பேயவர்மந்து......	3	4	5	9	6	60	3	15	2	1	1	1	
3	Gurreealoomund....	கரியாளுமந்து.......	2	3	2	3	5	55	7	16	3	1	1	1	
4	Thalapetharymund ..	தல்ப்பிதேரிமந்து....	4	2	4	7	30	90	13	25	3	2	2	1	
5	Coneycoraymund.....	கோணிக்கொரோமந்து	3	3	5	4	7	30	4	9	2	1	1	1	
6	Thanadoomund......	தேநாடுமந்து........	3	2	3	4	30	120	16	32	4	2	2	2	
7	Baithomund.........	பேட்தோமந்து.......	3	2	1	3	14	32	3	8	3	1	1	1	
8	Emmagulmund......	யெம் மேகல்மந்து.....	2	2	2	1	4	30	3	9	3	1	1	1	
9	Neercoonjee.........	நீர்குண்ஜி.	3	2	1	3	7	26	5	9	2	1	1	1	
10	Maulcodoo...........	மால்கோடு.........	4	3	4	2	5	16	2	3	2	1	1	1	
11	Nathanry...........	நாத்தேநேரி..........	2	1	3	2	16	70	7	14	4	2	2	1	
12	Pinnapool..........	பின்னேப்பூல்..........	2	1	1	1	14	40	9	16	2	1	1	1	
13	Nathy.............	நேத்தி............	1	1	3	2	6	26	4	12	2	1	1	1	
14	Currymoolee	கரிமொளி..........	2	1	2	4	4	20	2	3	2	1	1	1	

15	Anacungooloo......	ஆனக்கனகூளு......	5	3	3	4	7	16	0	3	2	1	1	1	
16	Bellathycoray.......	பெல்லாதிகோரே....	3	3	9	7	26	116	16	33	2	2	1	2	
17	Canthalmund.......	காகதல்மந்து.......	5	5	2	2	8	24	3	7	5	1	1	1	
18	Betmund..........	பெட்மந்து........	4	3	3	2	30	80	8	20	3	1	1	1	
19	Mathynymund......	மாதிநிமந்து........	3	1	2	1	15	50	8	16	2	1	1	1	
20	Munjagul..........	மஞ்சகல்..........	2	2	3	3	16	70	7	16	2	1	1	1	
21	Cycathal..........	கைகேதாள்.........	2	1	3	2	7	33	4	11	3	1	1	1	
22	Becapathy..........	பிக்கேபதி...........	2	3	2	4	6	16	2	4	2	1	1	1	
23	Jakathanay.........	சக்கதானே.........	1	1	5	6	9	42	3	14	2	1	1	1	
24	Ettuppacathy.......	யிட்டப்பகேத்தி.....	2	1	3	1	11	54	4	8	3	1	1	1	
25	Woolcodoo.........	உளல்கோடு........	3	1	0	0	4	32	5	11	2	1	1	1	
26	Currycul...........	கரிச்கல்............	2	2	4	0	6	51	4	6	2	1	1	1	
27	Bathary............	பாதகேரி...........	0	0	0	0	0	0	0	0	3	1	1	1	
28	Mail Currycul......	மேல்க்கரிகல்........	0	0	0	0	0	0	0	0	2	1	1	1	
29	Coodymund.........	கூடிமந்து..........	0	0	0	0	0	0	0	0	3	1	1	1	
30	Coodymaul.........	கோடிமால்.........	0	0	0	0	0	0	0	0	4	1	1	1	
31	Curythaloo.........	கரிதாளு...........	0	0	0	0	0	0	0	0	3	1	1	1	
32	Crothal............	குரோதாள்........	0	0	0	0	0	0	0	0	2	1	1	1	
33	Kengodoo..........	கேங்கோடு..........	0	0	0	0	0	0	0	0	2	1	1	1	
34	Thoraygoodoo......	தோரேகூடு.........	0	0	0	0	0	0	0	0	2	1	1	2	
35	Thavaloocoraymund..	தவுட்டுகோரேமந்து..	0	0	0	0	0	0	0	0	3	1	1	1	
36	Aveymund.........	ஏவிமந்து..........	0	0	0	0	0	0	0	0	4	1	1	1	
37	Mailgoodoo........	மேல்கூடு.........	0	0	0	0	0	0	0	0	3	2	1	1	
38	Bellathycoray.......	பெல்லாதிகோரே....	0	0	0	0	0	0	0	0	2	1	2	2	
39	Coodygadoo........	குடிகாடு..........	0	0	0	0	0	0	0	0	2	1	1	1	
		Carried forward....	71	55	77	82	299	1285	146	332	102	44	43	43	

Particular of Toda-munds in the Toda-naad Division of the Neilgherries, (continued.)

Number.	Name of Mund.		Adults.		Children.		Buffaloes.		Calves.		No. of Huts.	No. of Temples.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
	English.	Tamil.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.					
		Brought forward..	71	55	77	82	299	1285	146	332	102	44	43	43	
40	Bethencoodoo.......	பெத்தன்கூடு.......	0	0	0	0	0	0	0	0	2	1	1	1	
41	Thoraygoodoo	தோரேகூடு.........	0	0	0	0	0	0	0	0	3	1	2	1	
42	Codanalay..........	கடநெலே...........	0	0	0	0	0	0	0	0	1	1	1	1	
43	Mootoonaad........	முத்துநாடு.........	0	0	0	0	0	0	0	0	2	1	1	1	
44	Athen Tharnaad....	யெத்தின்தார்நாடு...	0	0	0	0	0	0	0	0	4	1	1	2	
45	Kytharagoo........	கைதெரகு..........	0	0	0	0	0	0	0	0	2	1	1	1	
46	Currycul..........	கரிக்கல்............	0	0	0	0	0	0	0	0	4	1	1	2	
47	Coodyagadoo.......	கொடியேகாடு......	0	0	0	0	0	0	0	0	2	1	1	1	
48	Baircadavoo........	பேர்க்கடவு........	0	0	0	0	0	0	0	0	3	1	1	1	
49	Condalarey.........	கொண்டலேரி......	0	0	0	0	0	0	0	0	3	1	1	2	
50	Buggoolah..........	பக்குளா..........	0	0	0	0	0	0	0	0	2	1	1	1	
51	Cubbulgoodoo.......	கப்பல்கூடு..........	0	0	0	0	0	0	0	0	2	1	1	1	
52	Oothal.............	ஊதாள்...........	0	0	0	0	0	0	0	0	2	1	1	1	
53	Oonna.............	ஒன்னே...........	0	0	0	0	0	0	0	0	3	1	1	1	
54	Thabagoodal........	தாபேகுடல்.......	0	0	0	0	0	0	0	0	2	1	1	1	
55	Argo...............	ஆர்கோ...........	0	0	0	0	0	0	0	0	3	1	1	1	
56	Coorathal..........	குரோதாள்.......	0	0	0	0	0	0	0	0	2	1	1	1	
57	Porthy.............	போர்தி...........	0	0	0	0	0	0	0	0	1	1	1	1	

58	Maicodoo	மேய்க்கோடு	0	0	0	0	0	0	0	0	2	1	1	2	
59	Mail Betmund	மேல்பெட்மந்து	0	0	0	0	0	0	0	0	1	1	1	1	
60	Codoomund	கோடுமந்து	0	0	0	0	0	0	0	0	2	1	1	1	
61	Ummandoo	அம்மெநாடு	0	0	0	0	0	0	0	0	2	1	1	1	
62	Nadoogoodoo	நெடுகூடு	0	0	0	0	0	0	0	0	2	1	2	1	
63	Cuggaroo'	கங்கேரு	0	0	0	0	0	0	0	0	2	1	1	1	
64	Coondoothal	குண்டுதாள்	0	0	0	0	0	0	0	0	2	1	1	1	
65	Adacoray	யெடக்கோரே	0	0	0	0	0	0	0	0	2	1	1	1	
66	Nareygo	நாரிகோ	0	0	0	0	0	0	0	0	3	1	1	1	
67	Naragoodoo	நாரோகூடு	0	0	0	0	0	0	0	0	3	1	1	1	
68	Avaycoray	யெவக்கோறே	0	0	0	0	0	0	0	0	4	1	1	1	
69	Povoora	போவுரே	0	0	0	0	0	0	0	0	1	1	1	1	
70	Cuthagodoo	க்த்தேகாடு	0	0	0	0	0	0	0	0	1	1	1	1	
71	Therearеymund	திரியேரிமந்து	0	0	0	0	0	0	0	0	3	1	1	1	
72	Anayculloo	ஆனேகல்லு	0	0	0	0	0	0	0	0	4	1	1	1	
73	Coonthagodoo	குந்தேகூடு	0	0	0	0	0	0	0	0	2	1	1	1	
74	Koveagadoo	கவ்வெகாடு	0	0	0	0	0	0	0	0	2	1	1	1	
	Total in the Toda-naad		71	55	77	82	299	1285	146	332	183	79	80	82	
	Particulars of Toda-Munds in the Meykenaad Division.														
75	Neddy Mund	நேடிமந்து	2	3	3	2	16	74	3	16	3	1	1	1	
76	Keilkoodiakadoo	இள்குடியேகாடு	0	0	0	0	0	0	0	0	3	1	1	1	
77	Peyree Mund	பேரிமந்து	0	0	0	0	0	0	0	0	3	1	1	1	
	Total in the Meykenaad		2	3	3	2	16	74	3	16	9	3	3	3	
	Carried forward		73	58	80	84	315	1359	149	348	192	82	83	85	

Particulars of Toda-Munds in the Parungenaad Division.

Number.	Name of Mund. English.	Name of Mund. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	No. of Huts.	No. of Temples.	No. of breeding Huts.	No. of Cattle P^c^ns.	Remarks.
		Brought forward ..	73	58	80	84	315	1359	149	348	192	82	83	85	
78	Narkodemund......	நாற்கோடுமந்து.....	2	1	1	1	2	6	1	2	2	1	1	1	Tenumund in ruins and 3 others.
79	Beydookul „	பேடுகளமந்து	3	2	2	2	2	15	2	3	2	1	1	1	
80	Koroomodoo „	கோறுமோடு........	4	3	2	2	3	9	2	3	3	1	1	1	
81	Koreekul „	கேழிகள்............	0	0	0	0	0	0	0	0	2	1	1	1	
82	Kodakudoo. „	கோடகாடு..........	0	0	0	0	0	0	0	0	2	1	1	1	
83	Koditaal.............	கோடித்தாள்........	0	0	0	0	0	0	0	0	2	1	1	1	
84	Halliyoor...........	அள்ளியூர்..........	2	5	2	4	3	4	1	2	3	1	0	1	
85	Buttamund.........	பட்டமந்து........	2	1	0	1	4	25	3	8	1	0	1	0	
		Total in the Parungenaad..	13	12	7	10	14	59	9	18	17	7	7	7	
		GRAND TOTAL..	86	70	87	94	329	1418	158	366	209	89	90	92	

THE BURGHERS.

Particulars of Burgher Villages in the Toda-naad Division.

Registered No.	Name of Village. English.	Name of Village. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	REMARKS.
1	Cadanaad.......	கடநாட்........	5	7	4	8	2	2	3	2	8	6	3	4	3	4	2	4	
2	Unneycoray (3)....	ஆட்டடடி......	20	17	9	12	10	14	4	9	40	45	10	17	22	22	8	15	
3	Uttavallay (4)	அண்ணிக்கொரே.	28	22	11	9	16	112	4	19	68	54	16	18	36	22	10	14	
4	Adhutty (2)......	அட்டவாளே....	6	7	5	6	4	16	0	8	6	4	2	4	5	4	2	4	
5	Thoonary	தூநேரி.........	18	20	13	17	12	30	4	6	28	42	9	13	14	26	10	9	
6	Kenggamoody	கெங்காமுடி....	1	2	1	2	2	1	1	2	0	0	0	0	0	2	1	3	
7	Cothavamoody	கொதவமுடி....	20	21	12	13	9	22	2	4	22	19	8	9	10	21	4	14	
8	Edoovutty.........	யிடுவட்டி......	5	6	5	7	2	2	2	1	4	4	2	1	3	6	1	4	
9	Mooratoothal.......	முரட்டுதாள்....	5	4	2	2	2	4	1	1	6	4	2	3	3	7	1	4	
10	Thorayhutty.......	துரோஅட்டி.....	5	6	5	4	1	2	1	0	6	6	2	1	3	6	1	3	
11	Osayhutty.........	ஒசஅட்டி.......	4	3	3	2	1	3	3	2	6	7	2	3	3	6	1	3	
12	Oormalay........	உளர்மலே.......	5	9	5	4	2	4	3	2	7	5	1	2	3	4	1	4	
13	Oolooputty.......	உலுப்பட்டி....	3	3	2	1	1	2	2	2	2	1	1	0	2	5	1	3	
14	Kadanaadoo-ooroo..	கடநாடுஉளரு...	17	19	15	18	4	23	4	14	28	19	5	12	15	19	2	4	
	Carried forward....		142	146	92	105	68	237	34	72	231	216	63	87	122	154	45	88	

Particulars of Burgher Villages in the Toda-naad Division, (continued.)

Registered No.	Name of Village.		Adults.		Children.		Buffaloes.		Calves.		Cattle.		Calves.		No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	REMARKS.
	English.	Tamil.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.					
		Brought forward.	142	146	92	105	68	237	34	72	231	216	63	87	122	154	45	88	
15	Thavanay........	தாவணே........	17	18	16	14	2	15	2	4	28	9	2	4	14	12	3	7	
16	Coonthachuppay...	குநதசப்பே	6	7	5	6	2	2	2	2	27	4	4	4	14	8	2	4	
17	Thoommanahutty...	தும்மன் அட்டி...	7	9	6	7	7	10	1	4	14	12	4	2	6	8	1	6	
18	Kenthooray.......	கெந்துரோ	6	7	3	6	2	1	0	0	8	6	4	3	4	7	1	5	
19	Cuppuchy........	கப்பசசி.........	8	10	4	5	5	2	2	3	10	9	4	2	4	10	2	4	
20	Thimmanadah	திம்மநாடா	4	4	2	2	2	2	1	2	6	5	2	1	3	5	1	3	
21	Moreyculloo.......	மோரிகலலு	6	5	2	3	2	3	2	2	0	0	0	0	0	7	1	3	
22	Cumbhutty........	கம்மட்டி.........	6	6	3	4	2	3	1	1	5	7	2	2	4	7	1	4	
23	Pilloocumbay......	பில்லுகம்பே....	4	5	2	4	2	1	0	0	6	6	2	2	3	6	1	3	
24	Cove'a...........	கவ்வே..........	6	5	3	6	3	3	0	3	8	10	2	4	4	6	1	4	
25	Murrayculloo... .	மறக்கல்லு.......	4	4	3	4	1	3	1	2	6	8	1	3	2	5	1	3	
26	Kavelooray.......	காவிலூரோ......	5	6	3	3	1	2	2	2	6	6	2	3	3	6	2	4	
27	Odayhutty........	ஒடைஅட்டி......	13	13	12	12	4	19	4	11	34	22	4	0	12	15	1	4	
28	Covedhutty.......	கவுட்டடி........	7	9	5	6	2	3	2	2	14	8	2	4	6	9	2	5	
29	Culhutty	கல்லட்டி..........	16	18	16	16	3	23	2	6	28	18	4	3	14	18	3	6	
30	Vunneymarahutty..	வன்னிமரஅட்டி..	4	4	4	2	2	3	2	2	4	1	1	0	2	3	1	3	
31	Akeconey........	யேககோணி......	9	10	10	12	9	20	6	14	16	12	4	5	7	13	4	4	
32	Thuttanarey......	தட்டநேரி......	6	6	4	5	3	4	4	5	8	4	2	1	3	8	2	3	
33	Karapilloo........	காலப்பிள்ளு....	4	4	2	3	2	2	2	1	5	3	1	2	2	5	2	4	

34	Oolluthy	உல்லத்தி	9	11	6	6	7	4	2	4	16	14	4	2	3	11	2	5
35	Mailooroo	மேலூரு	14	14	12	11	4	16	5	4	18	6	2	2	9	16	2	3
36	Mullygaray	மல்லிகரே	4	4	2	3	0	0	0	0	4	2	1	1	2	4	1	3
37	Uthycul	அத்திக்கல்	3	3	4	4	0	0	0	0	6	0	0	0	3	4	1	3
38	Nunjanadoo	நஞ்சநாடு	9	11	13	6	8	18	5	7	14	12	5	4	9	15	4	8
39	Cooroothoogoolee	குருத்துகுளி	5	5	2	3	7	8	6	5	8	9	2	4	7	6	2	3
40	Bickacunda	பிக்கேகண்டே	6	8	3	5	9	11	4	3	20	7	5	4	10	8	2	3
41	Solooroo	சோலூரு	17	17	13	16	12	44	13	22	44	11	7	4	21	12	4	8
42	Maikcoda	மேய்க்கோடே	6	7	3	4	6	4	2	3	12	8	6	2	8	8	2	4
43	Kodutty	கோடட்டி	7	9	4	7	3	4	2	2	16	12	4	3	8	9	2	5
44	Oocoopolliam	உக்குப்பாளயம்	19	19	15	17	5	22	3	12	26	18	6	4	17	19	2	5
45	Abanadoo	யெப்பேநாடு	11	13	17	10	7	9	5	7	24	24	9	7	12	14	4	8
46	Maraygoodoo	மாரேகூடு	5	5	2	3	2	12	1	4	4	2	1	0	2	7	2	4
47	Cumbhutty	கம்பட்டி	3	3	1	2	0	0	0	0	2	4	1	1	1	4	1	3
48	Coonooroo	குன்னூரு	6	6	3	4	4	10	3	2	6	6	2	1	3	8	2	6
49	Benthutty	பெநதட்டி	7	8	4	6	2	6	2	4	4	6	2	3	2	10	3	6
50	Ujjooroo	அச்சுரு	7	7	3	4	4	3	2	1	12	4	2	2	4	10	1	5
51	Theanhutty	தீனட்டி	14	14	12	13	6	20	4	10	24	13	2	4	12	16	1	5
52	Cuckoochoo	கக்கூசசு	7	8	3	5	4	6	2	4	8	7	4	1	6	8	1	3
53	Banahutty	பனேஅட்டி	6	6	2	4	4	4	2	4	8	10	3	5	6	8	1	4
54	Calyganutty	கலிக்கட்டி	3	3	1	2	0	0	0	0	6	6	2	2	3	4	1	2
55	Pygoola	பைகுளா	4	5	2	4	0	0	0	0	6	5	2	1	3	5	1	2
56	Thathervanoo	தாந்தர்வேனு	3	4	2	3	4	6	2	3	6	5	2	0	4	4	1	3
57	Kookal	கூக்கல்	14	16	15	19	12	26	6	12	34	25	9	8	20	22	2	10
58	Kookulthoray	கூக்கல்தோரே	26	29	10	13	6	30	6	10	20	80	9	13	10	30	2	12
59	Ooelutty	உயிலட்டி	15	16	18	19	6	19	7	14	18	8	3	3	9	12	2	6
	Carried forward		510	547	369	418	246	640	154	275	830	670	205	213	423	586	126	296

Particulars of Burgher Villages in the Toda-naad Division, (continued.)

Registered No.	Name of Village. English.	Name of Village. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
		Brought forward,	510	547	369	418	246	640	154	275	830	670	205	213	423	586	126	296	
60	Potoocoray........	பொட்டுக்கோரோ	7	9	4	6	6	8	4	2	16	6	2	2	8	10	2	6	
61	Segoola...........	சீகுளா.........	8	10	4	8	8	18	4	6	22	6	2	4	10	14	2	8	
62	Cooroomoody......	குருமுடி.........	6	6	4	4	8	10	4	6	20	4	3	2	9	10	2	6	
63	Aloompatchinggooly	யெலும்பச்சங்குளி	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	In ruins.
64	Thagaley..........	தேகலி..........	6	6	4	6	4	6	1	1	8	4	1	1	4	8	1	4	
65	Onaythlay.........	ஒனைதலே......	6	7	4	6	6	14	2	4	18	4	2	2	7	8	1	3	
66	Ooroo.............	உளரு..........	3	2	4	2	0	0	0	0	4	2	1	1	2	4	1	3	
67	Sodalaroo.........	சொடலேரு.....	3	5	2	3	2	2	0	0	2	1	1	0	2	4	1	2	
		(Toda-naad) Total....	549	592	395	453	280	698	169	294	920	697	217	225	465	644	136	328	

Particulars of Burgher Villages in the Meykenaad Division.

Registered No.	Name of Village. English.	Name of Village. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
1	Kaity............	கேத்தி..........	10	8	5	6	2	7	1	2	10	12	3	5	5	12	4	3	
2	Oolladah..........	உல்லாடா.......	16	17	9	13	2	7	1	2	30	12	3	5	15	13	6	5	
3	Ellanully..........	யெலலனள்ளி.....	18	17	8	9	3	5	2	3	30	15	6	3	15	17	2	2	
4	Kecketty..........	கெக்கட்டி........	10	12	10	5	0	0	0	0	16	12	3	6	8	10	2	2	
5	Mokutty..........	மொக்கட்டி.....	2	3	2	3	0	0	0	0	2	3	1	2	1	6	1	2	

6	Colungarah	கோலங்கரு	5	5	6	2	0	0	0	0	6	4	1	2	3	3	1	1	
7	Manaputtoo	மனப்பட்டு	2	2	3	1	0	0	0	0	2	3	1	2	1	5	1	1	
8	Uchnakulloo	அச்சனக்கல்லு	10	11	6	7	1	2	1	1	8	12	5	6	5	10	5	2	
9	Keryadah	கிரைஆடா	20	21	17	19	8	11	7	8	20	40	10	11	10	20	6	7	
10	Cummunthoo	கம்மந்து	5	6	4	5	0	0	0	0	6	4	2	3	3	5	1	1	
11	Mail Oodirutty	மேல்உடையாட்டி	11	9	6	9	4	4	2	3	12	15	8	9	7	10	4	3	
12	Keil Oodirutty	கீள்உடையாட்டி	3	4	3	5	1	1	1	1	4	6	2	2	2	4	1	2	
13	Sogathooray	சோகத்துரே	9	10	5	7	2	3	1	2	12	12	6	3	6	9	3	5	
14	Arenully	யேர்நள்ளி	2	3	2	4	0	0	0	0	4	3	1	2	2	4	1	1	
15	Kartary	கார்ட்டேரி	25	30	15	16	2	6	2	3	30	30	10	12	16	25	6	7	
16	Thoothutty	தூதட்டி	5	5	3	6	0	0	0	0	8	9	4	5	4	5	2	1	
17	Nadoovutty	நடுவட்டி	4	4	3	5	0	0	0	0	6	6	2	3	3	4	1	1	
18	Thoothooroo	தூதூரு	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	In ruins.
19	Kodaroo	கோடேரு	4	5	3	2	0	0	0	0	6	4	2	3	3	4	1	2	
20	Maungaudah	மாணிஆடா	4	4	4	2	0	0	0	0	12	0	0	0	4	4	1	1	
21	Athycarutty	அதிகாட்டி	40	46	20	21	9	12	6	9	50	60	30	20	26	30	6	10	
22	Aunyhutty	அணிஅட்டி	4	4	2	3	0	0	0	0	4	0	0	0	2	4	1	1	
23	Mootynadoo	முட்டிநாடு	9	9	8	9	2	6	2	3	20	20	10	8	9	9	2	3	
24	Thindooculloo	திண்டுகல்லு	4	4	3	5	0	0	0	0	4	0	0	0	2	4	1	2	
25	Thamutty	தாமட்டி	13	14	12	9	3	5	2	3	20	20	8	9	10	14	4	4	
26	Keilooroo	கீளுரு	2	2	1	3	0	0	0	0	2	4	0	0	1	2	1	1	
27	Alatanay	ஆளட்டனே	4	4	2	3	0	0	0	0	4	0	0	0	2	4	2	1	
28	Munjacumbay	மஞ்சகம்பே	5	6	3	6	0	0	0	0	6	0	0	0	3	5	1	1	
29	Kotheyvane	கோத்திவென்	2	4	2	3	0	0	0	0	2	0	0	0	1	2	1	1	
30	Vengulloo	வெங்கலலு	4	4	2	3	0	0	0	0	4	0	0	0	2	4	1	1	
31	Maincelay	மயனிவே	6	6	3	2	1	2	1	1	4	4	2	1	2	5	1	1	
		Carried forward	258	279	172	193	40	71	29	41	344	310	120	122	173	253	70	75	

Particulars of Burgher Villages in the Meykenaad Division, (continued.)

Number.	Name of Village.		Adults.		Children.		Buffaloes.		Calves.		Cattle.		Calves.		No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens	Remarks.
	English.	Tamil.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.					
		Brought forward,	258	279	172	193	40	71	29	41	344	310	120	122	173	253	70	75	
32	Thanaadoo......	தேநாடு........	8	9	5	6	2	3	1	1	8	8	4	3	4	7	4	2	
33	Mailooroo.......	மேய ஊரு.....	9	10	8	6	0	0	0	0	6	7	2	3	3	9	4	3	
34	Osayhutty	ஒசஅட்டி.....	6	6	5	4	0	0	0	0	4	0	0	0	2	7	1	1	
35	Mailutty........	மேலட்டி......	4	4	3	1	0	0	0	0	4	0	0	0	2	4	1	2	
36	Causolay........	காசாலேல்.....	4	4	2	1	0	0	0	0	4	0	0	0	2	4	1	1	
37	Veckeecoodul....	விக்கிகுட.......	19	19	18	16	2	10	2	3	16	20	9	8	8	18	4	3	
38	Koodulhutty.....	குடலட்டி.....	5	5	3	2	0	0	0	0	8	4	2	3	4	5	0	1	
39	Valacolay.......	வாளக்குலே....	15	16	17	12	4	8	4	4	20	20	10	12	10	15	4	6	
40	Meecaroo.......	மீக்கேரு......	12	10	9	10	2	5	2	3	20	20	5	8	10	11	4	5	
41	Maunyhutty.....	மணிஅட்டி....	30	30	20	25	4	7	4	5	30	40	10	12	15	30	4	7	
42	Aulacoray.......	ஆலக்கோரே....	5	5	3	4	1	1	1	0	8	6	2	3	4	5	0	3	
43	Thunggadoo.....	தங்காடு.......	8	9	5	7	1	2	1	1	16	17	8	3	8	9	4	3	
44	Oornully........	ஒர்னள்ளி......	20	20	10	12	2	4	2	1	20	30	10	8	10	20	4	5	
45	Cunnary........	கன்னேரி......	7	8	3	5	0	0	0	0	10	12	4	2	5	7	1	2	
46	Munthana.......	மந்தணே......	5	6	3	2	0	0	0	0	8	6	2	3	4	5	1	1	
47	Bembutty.......	பெம்பட்டி....	8	8	3	6	1	2	1	1	10	12	4	6	5	8	1	2	
48	Baitthaul.......	பேலதாள்.....	9	9	8	6	1	3	2	1	14	12	5	4	7	8	3	3	
49	Uttabylee.......	அட்டபயிலி....	6	6	3	2	2	4	2	3	8	10	4	3	4	6	2	4	
50	Porthy..........	போர்த்தி.....	8	9	6	3	1	5	1	3	10	12	8	3	5	8	1	3	

51	Ethoolaroo.......	யித்துலாரு.. ...	15	16	8	9	1	5	2	3	20	20	10	4	10	15	2	5	
52	Poothoocutty......	புதுக்கட்டி.....	6	6	3	9	1	2	1	1	10	10	9	1	5	7	1	3	
53	Ubboogoodoo.....	அப்புகூடு......	4	4	1	2	0	0	0	0	6	6	2	1	3	4	4	1	
54	Cullacoray.......	கல்லக்கோரே....	8	9	6	7	2	4	1	2	16	10	6	3	8	9	4	4	
55	Otymarahutty.....	ஒட்டிமறஅட்டி..	9	9	8	9	0	0	0	0	10	12	4	5	5	8	2	2	
56	Nonthal........	நொனதாள்....	10	9	8	7	1	3	1	2	15	10	8	3	8	10	2	3	
57	Thoolythalay.....	தூளிதலே......	5	4	2	3	0	0	0	0	6	6	2	1	3	5	3	1	
58	Moothoogulloo....	முதுகுல்லு.....	3	3	2	2	0	0	0	0	4	0	0	0	2	4	3	1	
59	Oolyculloo.......	உளிக்கல்லு.....	2	2	1	1	0	0	0	0	4	0	0	0	2	2	1	1	
60	Caroocavada.....	கருக்கவடே......	6	6	3	4	1	1	1	1	6	4	1	2	3	6	1	3	
61	Thaneylay.......	தேநிலே.......	4	4	2	4	1	2	1	1	8	6	2	2	4	5	0	3	
62	Jacolutty.......	சக்கோலட்டி...	3	4	2	3	0	0	0	0	4	6	2	2	2	4	0	1	
63	Bunhutty.......	பன்னஅட்டிஊரு	3	3	3	2	0	0	0	0	2	2	1	2	1	5	2	3	
64	Mooloogooroo...	முள்ளுகூரு.....	15	17	6	8	3	8	2	4	16	6	2	2	6	10	3	3	
65	Aurutty.........	ஆரட்டி.......	2	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	Building.
66	Munjooroo......	மஞுகுரு......	10	12	4	6	2	8	2	4	8	4	2	2	4	11	4	5	
67	Candhutty.......	கண்டட்டி.....	2	2	1	2	0	0	0	0	2	2	1	1	1	3	2	3	
68	Maunyculloo.....	மணிக்கல்லு....	1	2	2	1	0	0	0	0	2	1	0	0	1	2	1	1	
69	Thoonary.......	தூநேரி........	3	3	2	3	1	4	1	1	4	3	1	2	2	4	2	3	
70	Mookeemalay.....	முக்கிமலே.....	3	3	4	6	1	2	1	1	4	6	1	2	2	5	2	3	
71	Koondinai.......	குண்டிநாய்....	2	2	2	1	0	0	0	0	0	0	0	0	0	3	0	0	Building.
72	Keilkoontha Ooroo..	கீள்குந்தேஊரு.	18	16	18	8	6	16	2	8	10	12	2	4	9	24	6	8	
73	Madacundy.......	மடக்கண்டி...	4	2	3	2	1	3	1	1	4	6	1	2	2	6	2	3	
74	Bauckoray........	பாக்கோரே....	8	6	2	4	2	44	4	12	26	14	4	2	13	12	2	3	
75	Keereamalay......	கிரியமலே....	2	2	1	2	1	3	1	1	4	2	1	2	2	2	1	2	
76	Bukhutty........	பக்கட்டி.....	4	3	2	1	1	4	1	2	4	4	1	2	2	5	1	2	
	Carried forward....		598	623	402	429	88	234	74	111	763	698	272	253	385	613	165	199	

Particulars of Burgher Villages in the Meykenaad Division, (continued.)

Number.	Name of Village. English.	Name of Village. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
		Brought forward.	598	623	402	429	88	234	74	111	763	698	272	253	385	613	165	199	
77	Adacadoo	வெடக்காடு	12	10	4	6	2	18	2	14	8	10	2	4	4	14	5	6	
78	Soondutty.......	சுணடட்டி.....	10	8	6	4	2	16	4	12	10	10	2	4	5	12	5	6	
79	Mailkoontha Ooroo.	மேல்குந்தேஉளரு	8	6	4	5	2	8	2	4	16	10	2	6	7	12	3	4	
80	Uttoomunnoo.....	அட்டுமன்னு...	6	6	3	7	1	4	1	2	8	14	4	4	4	8	4	5	
81	Koraypoddum	கிறயப்போடெமய	4	4	2	3	2	6	1	3	6	6	2	2	3	6	3	4	
82	Mooleymalay.....	முள்ளிமலே.....	5	6	4	3	1	3	0	2	6	3	1	1	3	7	2	3	
83	Beccumboo	பெக்கம்பு	2	2	0	3	1	2	1	0	4	2	1	1	2	4	2	3	
84	Aresinggoo	யேர்சிங்கு	2	1	1	4	0	2	0	1	2	2	1	0	1	3	2	3	
85	Gagegaputty	கெச்சிகபட்டி...	2	2	1	3	1	2	1	1	4	2	1	1	2	3	1	2	
86	Kinnakoray......	கிண்ணக்கோறே.	6	8	2	6	2	18	2	14	4	12	4	2	2	6	1	2	
		(Meykenaad) Total..	655	676	429	473	102	313	88	164	831	769	292	278	418	688	193	237	

Particulars of Burgher Villages in Parungenaad Division.

Number.	Name of Village. English.	Name of Village. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
1	Melythanoo	மிளிதேனு......	28	22	26	23	2	10	2	3	20	35	8	7	13	28	3	6	
2	Karevuttoo	கேற்வட்டு.....	26	18	14	7	2	10	2	2	16	17	6	4	10	17	2	8	
3	Osayhutty	ஒசஅட்டி	2	2	0	2	0	0	0	0	0	0	0	0	0	2	0	0	
4	Cumbhuttythoray..	கம்பட்டிதுரே ..	15	12	9	6	0	4	0	0	6	12	4	5	3	12	4	5	

5	Cumbhutty. . . .	கம்பட்டி.	12	11	7	5	1	5	0	1	7	15	4	6	4	11	3	5	
6	Baircunny	பேர்கன்னி . . .	8	6	6	5	2	11	1	2	6	10	3	5	4	8	2	5	
7	Munthyhutty. . .	மந்திஅட்டு . . .	6	4	2	0	1	5	2	4	4	8	2	1	2	5	2	3	
8	Ivooroo.	அயவூரு.	2	2	2	1	1	0	1	0	2	2	0	0	0	2	4	2	
9	Kunnarymookoo.	கன்னேரிமுக்கு. .	18	14	10	6	4	1	0	0	8	14	3	6	4	14	2	7	
10	Anihutty.	அனை அட்டி. . .	5	4	3	2	7	2	1	0	2	4	1	1	1	5	2	2	
11	Thimmutty. . . .	திம்மட்டி. . . .	18	15	9	7	2	0	0	0	6	14	4	3	3	17	4	5	
12	Cadacodoo	கடக்கோடு. . . .	10	9	5	3	2	0	2	1	4	9	4	2	2	9	3	4	
13	Araycumbay . . .	அரகம்பை. . . .	5	5	3	3	2	0	0	0	2	5	1	1	1	5	3	3	
14	Poodyainggy. . .	புடியெங்கி. . . .	4	4	3	2	1	3	0	0	4	7	2	1	2	4	3	4	
15	Koondadah. . . .	குண்டாடா. . .	12	9	6	4	0	0	0	0	4	14	3	2	2	12	4	4	
16	Nadoongoolah . . .	நெடுங்குளா. . .	23	20	10	9	2	6	1	3	14	24	10	6	5	23	6	13	
17	Salacothy.	செலக்கோதை .	18	19	11	8	2	3	1	2	6	20	6	3	3	18	3	5	
18	Soondutty	சுண்டட்டி . . .	15	13	9	5	2	16	0	5	8	15	3	1	3	15	3	7	
19	Odanoo.	ஒடேனு	8	8	4	3	2	5	2	6	6	6	3	2	2	7	3	6	
20	Poymoody	பாயமுடி	10	10	7	4	1	7	2	4	8	10	3	2	3	10	2	6	
21	Ooloothutto	உல்லுதட்டு . . .	3	3	1	1	0	0	0	0	0	0	0	0	1	3	2	1	
22	Calygarayooroo . .	களிகரோஊரு. . .	18	18	12	9	3	15	4	4	16	14	5	4	9	16	3	9	
23	Oroosolay	ஒருசோலை	19	17	11	6	2	12	10	7	13	16	6	4	8	18	4	8	
24	Thanadoo	தேநாடு	26	20	13	14	6	30	2	5	22	26	9	7	10	26	6	18	
25	Thoonary	தூநேரி.	12	10	6	4	4	13	2	2	8	8	3	3	4	11	2	10	
26	Moothoorabaika . .	முத்தூர்பேக்கே .	3	2	2	1	0	0	0	0	0	0	0	0	0	2	0	0	Now building.
27	Thoombymala . . .	தும்பிமலே. . . .	10	9	3	3	0	0	0	0	4	8	2	3	2	8	2	6	
28	Mailhutty	மேலட்டி.	9	8	5	6	3	6	0	2	4	12	6	2	2	6	2	4	
29	Kengaray	கெங்கரே.	12	11	7	6	1	10	1	3	2	15	4	3	2	12	2	5	
30	Adaculloo	அடக்கல்லு. . . .	6	5	3	5	2	6	1	2	4	6	2	3	2	5	1	5	
	Carried forward. . . .		363	318	209	160	56	90	37	53	175	330	145	90	95	307	124	136	

Particulars of Burgher Villages in Parungenaad Division, (continued.)

Number.	Name of Village. English.	Name of Village. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
		Brought forward.	363	310	209	160	56	90	37	53	178	330	145	90	95	307	124	130	
31	Bungythuttoo..........	பங்கிதட்டு . . .	5	4	2	1	1	8	1	2	4	4	2	1	2	4	1	4	
32	Kooneysolay..........	கூணிசோலே. . .	3	3	2	1	1	4	1	1	2	3	1	2	1	3	1	4	
33	Soolloogoodoo........	சுள்ளுகூடு. . . .	13	10	4	6	2	12	2	4	8	16	6	5	4	10	1	8	
34	Munjamabay..........	மஞ்சமலே. . . .	5	3	2	1	1	6	1	3	2	6	3	1	1	4	1	4	
35	Beathoocumbay......	பீதுகம்பே. . . .	6	4	4	3	1	9	1	0	4	8	3	4	2	5	1	5	
36	Conacoray.............	கோணுட்கரை. . .	31	30	16	31	1	10	2	1	18	20	5	6	12	30	4	15	
37	Baitlandah.............	பெட்லாடா. . .	4	4	3	2	1	6	1	2	4	10	1	2	2	4	1	3	
38	Jacanary................	சக்கநாரி. . . .	20	20	10	15	4	10	2	3	14	20	4	5	7	20	2	10	
39	Mailhutty..............	மேலட்டி.	10	9	8	5	1	5	1	2	4	10	2	3	2	10	2	5	
40	Keilhutty................	கிளட்டி.	8	7	6	4	1	6	1	3	4	11	1	4	2	8	2	5	
41	Jacatha	சக்கேதா.	10	9	7	5	1	10	2	3	10	20	2	3	5	14	2	9	
42	Arayvanoo.............	அரவேனு. . . .	18	12	6	3	1	6	1	2	4	10	1	3	2	10	1	5	
43	Thoombooroo.........	தும்பூரு.	9	8	4	5	1	8	2	3	6	13	3	2	4	8	1	5	
44	Bethutty................	பெடஅட்டி. . .	5	3	3	4	1	6	1	2	4	10	2	1	2	9	1	5	
45	Selvelah................	செல்விளா. . . .	5	3	2	3	1	3	1	2	4	8	2	3	2	4	3	3	
46	Gasalahdu..............	கெசலாட. . . .	8	6	3	4	2	7	2	1	4	9	1	4	2	8	1	3	
47	Jacathal.................	சக்கேதாள். . . .	30	25	10	11	1	10	4	2	20	30	5	3	12	26	2	10	
48	Bairhutty...............	பேர்அட்டி. . . .	3	3	2	2	0	0	0	0	2	4	1	2	1	3	1	1	
49	Otheygathutty . . .	ஒதிகஅட்டி . . .	5	4	1	2	0	3	1	0	2	5	1	3	1	4	1	2	

50	Munjetho.	மஞ்சிதோ	5	4	2	3	1	6	0	2	2	6	2	1	1	5	1	1
51	Punthemay.	பந்திமே	2	2	2	1	0	0	0	0	2	5	1	1	1	2	1	2
52	Ooboothalay.	உப்புதலை	13	13	3	4	1	5	1	1	4	10	1	2	2	12	1	2
53	Coonnooroo.	குண்ணூரு.	10	11	6	4	1	6	1	2	8	20	2	3	4	10	1	4
54	Bichutty.	பிக்கட்டி	12	11	5	6	1	6	1	0	12	20	2	3	6	12	1	6
55	Bogunhutty.	பொகனடடி	10	9	3	4	1	8	1	2	4	10	1	2	2	10	2	3
56	Adapulhy.	யெடப்பள்ளி	30	30	12	14	2	22	3	3	10	20	5	3	4	30	8	10
57	Eloothooray.	யிளுத்துறொ	25	22	9	10	1	21	1	3	8	20	4	4	4	20	2	7
58	Arabettoo.	அரபெட்டு.	5	4	2	2	1	10	1	1	2	10	1	2	1	5	1	2
59	Beanutty.	பீனட்டி	5	4	3	4	1	8	1	2	2	8	1	1	1	4	2	2
60	Nadoovutty.	நடுவட்டி	10	9	5	4	1	11	2	2	6	10	2	2	2	10	2	5
61	Cuttabettoo.	கட்டபெட்டு.	13	12	6	7	1	12	1	2	6	12	3	2	2	15	2	4
62	Thogoolutty.	தொகுலடடி	5	6	7	5	0	0	0	0	2	6	2	1	1	6	2	3
63	Beppanoo.	பெப்பேனு	13	10	6	5	1	10	2	1	2	10	1	3	1	8	1	2
64	Alaycaroo.	ஆளக்கேறு	3	2	2	1	1	12	1	2	2	10	1	2	1	3	1	2
65	Kairoovanoo.	கேருவேனு	8	9	6	8	2	6	2	3	4	12	5	4	2	8	2	2
66	Culhutty.	கல்லடி	11	12	7	9	1	20	3	2	6	20	6	4	3	13	2	3
67	Mailhutty.	மேலடடி	12	13	9	10	2	17	4	3	4	16	7	3	2	12	3	3
68	Bethalem.	பெததாளம்.	16	18	9	8	1	15	2	3	6	20	6	5	3	16	1	2
69	Nadoovutty.	நடுவட்டி	11	13	7	9	2	19	2	4	4	21	7	3	2	10	1	2
70	Pyainggy.	பய்யெங்கி	4	5	5	3	1	12	2	3	2	8	2	2	1	4	1	2
71	Mail Pyainggy.	மேலபய்யெங்கி.	3	4	2	3	1	10	1	2	2	9	3	1	1	4	2	3
72	Cuttabettoo.	கட்டபெட்டி	6	7	8	3	2	19	1	4	2	10	2	2	1	6	1	2
73	Nadoovutty.	நடுவட்டி.	6	10	8	7	1	12	2	3	4	12	3	2	2	10	1	2
74	Alacegroo.	ஆளக்கேறா	11	12	7	6	1	10	1	2	4	17	4	2	2	10	1	1
	(Parungenaad) Total		813	729	445	390	107	586	100	146	436	885	227	204	225	760	155	351

ABSTRACT.

Number.	Name of Village. English.	Name of Village. Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
67	Burghers in. . . .	Todanaad. . .	549	592	395	453	280	698	169	292	920	697	217	225	465	644	135	328	
86	do. . . .	Meykenaad. .	655	676	429	473	102	313	88	164	831	769	292	278	418	688	193	237	
74	do. . . .	Parungenaad	813	729	445	390	107	586	100	146	436	885	227	204	225	760	155	351	
		Total . .	2017	1997	1269	1316	489	1597	357	602	2187	2351	736	707	1108	2092	483	916	

THE KOTHERS.

Number.	English.	Tamil.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Cattle. Male.	Cattle. Female.	Calves. Male.	Calves. Female.	No. of Ploughs.	No. of Houses.	No. of breeding Huts.	No. of Cattle Pens.	Remarks.
1	Badoogoolah. . .	படுகுளா. . .	19	18	14	9	0	0	0	0	16	5	4	1	8	16	2	3	
2	Theroochagady. .	திரிசசெடி...	26	28	19	18	0	0	0	0	12	7	4	2	6	18	2	5	
3	Kotergherry. . .	கோ.த தகிரி. .	12	12	8	9	0	0	0	0	20	15	4	4	12	12	3	5	
4	Keil Kotergherry	கிள்கோத தகிரி	9	8	4	5	0	0	0	0	6	12	2	3	4	9	4	5	
5	Kallymalay. . . .	கொலவிமலே	20	20	15	12	0	0	0	0	20	40	10	11	12	17	2	6	
6	Kontha Kotergherry. . . .	குநதேகோத தகிரி . . .	7	6	4	5	0	0	0	0	18	8	2	0	8	9	4	2	
7	Goodaloor Kotergherry. . . .	குடலூா கோ தகிரி . . .	Situated below the plateau under Neddiwuttum.—Out of the map—account not taken.																
		Total. .	93	92	64	58	0	0	0	0	92	87	26	21	50	81	17	26	

THE ERULARS.

1	Syrul..........	சீரல்	4	3	4	5	1	2	2	2	1	2	1	1	4	1		
2	Mylaroo........	மய்லேரு . . .	4	4	4	2	0	0	0	0	0	1	0	1	4	2		
3	Koocaroo..	கூக்கேரு . . .	3	3	4	3	0	0	0	0	0	0	0	0	3	1		
4	Echunggo	ஈச்சபங்கோ.	2	2	1	0	0	0	0	0	0	0	0	0	2	1		
5	Coonjapana.	குஞ்சப்பனை .	9	9	6	5	6	0	0	0	3	5	2	1	9	1		
6	Velleery....	வெளளிரி . . .	5	4	2	3	0	0	0	0	3	4	2	2	4	1		
7	Aracodoo.... ..	அரக்கோடு. .	12	11	8	9	3	8	2	3	2	10	2	3	11	2		
8	Mullycuppay. ...	ம்ல்லிகொப்பை	15	14	9	7	4	13	3	5	2	15	4	2	16	3		
9	Ooryketchy.	உரிக்கெச்சி. .	5	5	2	3	1	5	1	2	1	6	1	2	5	2		
10	Cogeedah.... ..	கோகிடா . . .	16	17	5	6	2	12	2	3	2	12	2	3	16	1		
11	Covgeedah..	கவகிட்டா	5	4	1	3	1	5	1	2	1	4	1	0	5	2		
12	Nadoovooroo. ...	நடுஊரு. . .	16	7	5	6	2	12	2	3	3	17	2	5	18	2		
13	Carapanay.	கார்ப்பனை . .	6	7	2	5	0	0	0	0	0	0	0	0	6	2		
14	Neercoondy.....	நீர்குண்டி. . .	9	8	3	5	1	6	1	2	1	10	1	3	9	2		
15	Malapooroo	மலப்பூரு. . .	4	8	4	3	1	4	1	2	3	6	1	2	5	4		
16	Erapanay	ஈர்ப்பனை . . .	4	5	2	3	0	0	0	0	2	6	1	2	4	2		
17	Moolachuppay. ..	மூலசப்பை. .	4	4	3	2	0	0	0	0	1	2	1	3	4	1		
18	Bawgapanay	பாகப்பனை...	8	9	4	5	1	7	2	3	2	10	2	2	8	2		
19	Beathoocumb. ...	பீதுகம்பே. ..	2	2	2	2	1	3	1	1	1	4	1	2	2	2		
20	Chumbawnaray. .	சம்பாணர். ..	4	5	2	3	1	0	0	0	0	0	0	0	4	2		
21	Mawvoolah	மாவுள்.	8	8	3	4	1	4	1	2	1	8	1	2	8	2		
22	Aravathy.......	ஆரவதி	3	2	1	1	0	0	0	0	0	0	0	0	3	0		
		Total..	148	151	77	85	26	81	19	30	29	122	25	36	150	38		

ABSTRACT

Of the Population of the Neilgherry Mountains.

Number of Villages or Munds.	Name of Tribe.	Adults. Male.	Adults. Female.	Children. Male.	Children. Female.	Buffaloes. Male.	Buffaloes. Female.	Calves. Male.	Calves. Female.	Bulls and Bullocks.	Cows.	Bull Calves.	Cow Calves.	Houses.	Ploughs.	Cattle Pens.	Total Souls of each Tribe.	Remarks.
85	Todars.	86	70	87	94	329	1418	158	366	0	0	0	0	209	0	91	337	
227	Burghers.	2017	1997	1269	1316	489	1597	357	602	2187	2351	736	707	2092	1108	916	6599	
6	Kothers	93	92	64	58	0	0	0	0	92	87	26	21	81	50	26	307	
22	Erulars.	148	151	77	85	26	81	19	30	29	122	25	36	150	0	38	461	
322	GRAND TOTAL. .	2344	2310	1497	1553	844	3096	534	998	2308	2560	787	764	2532	1158	1071	7704	Souls.

14—665—48.

in No. 396—48.

SUMMARY.

	Souls.
Europeans,	342
East Indians,	154
Hill Tribes,	7,704
Hindoos, Mussulmauns, Pariahs, &c.,	8,887
Total Population of the Neilgherries..	17,087

J. OUCHTERLONY, Captain,
Superintendent Neilgherry Survey.

METEOROLOGICAL

Kept at the Survey Office, KOTERGHERRY,

Maximum Pressure, observed at 9h. 50m. A. M.						
		Temperature.			Wind.	
Days of the Month.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.
1	24·104	63·5	,,	59·5	Calm	Cloudy.
2	·119	62·5	62·8	61·	Calm	Cloudy.
3	·106	63·	63·2	60·8	Calm	Cum. strat.
4	·112	62·8	62·5	61·	Calm	Cloudy drizzle.
5	·134	62·5	62·	59·8	Calm	Clear.
6	·134	62·5	61·2	58·	Calm	Cloudy.
1848*						
7	·184	61·	60·8	55·5	,,	Clear.
8	·178	61·	60·5	56·2	N. E.	,,
9	·192	61·5	60·	56·	N. W.	,,
10	·195	62·2	62·5	59·8	,,	,,
11	·200	62·5	62·8	58·2	,,	,,
12	·213	63·5	63·8	58·5	Calm	Cloudy.
13	,,	,,	,,	,,	,,	,,
14	,,	,,	,,	,,	,,	,,
15	·204	63·5	63·7	60·	Calm	Cirri cumuli.
16	·211	63·5	63·2	60·	,,	Clear.
17	·198	64·5	64·9	61·	,,	,,
18	·192	62·	62·5	58·	,,	,,
19	·188	62·3	63·	58·	,,	,,
20	·189	64·5	63·8	61·	,,	,,
21	·189	64·5	65·2	61·5	N. E.	Cumuli.
22	·191	65·	65·2	59·8	N. E.	Clear.
23	·187	62·	62·5	59·8	N. E.	,,
24	·176	63·8	65·8	61·8	N. E.	,,
25						
26						
27						
28						
29						

REGISTER

for the Month of February, 1847/1848*

Minimum Pressure, observed at 4 p. m.						
	Temperature.			Wind.		Rain.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
						1847
24·090	64·	65·2	60·5	Calm	Cloudy.	
·091	63·8	64·8	61·	Calm	Cloudy.	·61
·109	65·5	66·2	62·	Calm	Cloudy.	1·40
·108	65·8	66·5	62·2	Calm	Clear cumuli.	
·139	65·	65·8	61·2	Calm	Clear.	
·152	63·5	65·	61·	North	Cloudy.	·05
·175	65·5	67·5	60·8	Calm	Clear.	·26
·169	64·	65·5	59·5	,,	,,	
·184	65·2	66·2	61·5	N. W.	,,	·44
·191	66·	68·	62·5	Calm	,,	·09
·194	65·	67·	61·5	,,	,,	
·190	65·2	66·9	61·3	,,	Cloudy.	2·56
,,	,,	,,	,,	,,	Clear.	·74
·197	68·	70·	64·	N.	,,	1·90
·197	66·	67·7	62·5	N. W.	,,	3·06
·194	66·7	68·2	63·	Calm	,,	
·184	66·	68·	63·	,,	,,	
·187	65·5	67·5	62·	,,	,,	
·175	66·5	68·5	63·2	,,	,,	
,,	,,	66·5	,,	N. E.	Cumuli.	
·178	67·5	67·8	64·5	N. E.	Cirri.	·04
·183	67·2	69·	63·	N. E.	Clear.	1·74
·174	66·5	68·	,,	N. E.	,,	·10
,,	,,	,,	,,	,,	,,	·03
					The rain register is all for 1847.	
					Total rain...	13·88
					in 1848 ,, ,, ...	none.

March,

Maximum Pressure, observed at 9*h.* 50*m.* a. m.						
		Temperature.			Wind.	
Days of the Month	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.
1	,,	,,	,,	,,	,,	,,
2	24·129	62·2	62·5	60·5	Calm	Clear cumuli.
3	·182	63·5	63·5	61·5	Calm	Clear cumuli.
4	·178	61·	60·	57·5	N. W.	Clear cumuli.
5	·191	62·5	62·2	59·8	Calm	Clear cumuli.
6	·181	61·2	61·	57·5	Calm	Clear cumuli.
7	,,	,,	,,	,,	,,	,,
8	·187	62·	62·5	58·	Calm	Clear cumuli.
9	·192	62·	62·8	59·5	Calm	Clear cumuli.
10	·190	65·	64·5	60·	Calm	Clear cumuli.
11	·171	65·	64·6	61·	Calm	Clear cumuli.
12	·180	66·	65·	63 5	Calm	Clear cumuli.
13	·187	63·8	64·	60·8	North	Clear cumuli.
14	·161	,,	63·2	,,	,,	,,
15	·191	63·8	63·5	61·	Calm	Cloudy drizzle.
16	·248	63·8	63·8	61·5	Calm	Cloudy.
17	·241	63·5	64·	61·	South	Cloudy drizzle.
18	·186	64·	64·	60·2	S. W.	Clear.
19	·180	64·2	64·	61·5	S. E.	Clear.
20	·180	63·5	63·	59·8	South	Clear.
21	,,	,,	,,	,,	,,	,,
22	·184	61·2	61·8	58·5	S. E.	Cloudy.
23	·176	63·8	64·	59·	N. E.	Clear.
24	·140	62·8	63·5	58·2	East	Clear.
25	·153	64·8	64·	60·2	N. E.	Clear.
26	·158	63·8	64·5	61·8	N. E.	Clear.
27	·147	66·5	66·	62·5	N. E.	Clear.
28	,,	,,	,,	,,	,,	,,
29	·146	65·	65·8	59·2	N. W.	Clear.
30	·159	65·5	66·8	63·8	N. E.	Clear.
31	·171	67·	66·5	63·5	N. E.	Cum. strat.

.847.

Minimum Pressure, observed at 4 p. m.						
	Temperature.			Wind.		Rain.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
"	"	"	"	Calm	"	"
4·160	61·8	66·	62·5	Calm	Calm, cloudy.	2·00
·163	65·	65·5	62·5	North	Clear, cumuli.	
·182	65·	65·5	60·5	Calm	Clear, cumuli.	
·160	63·	64·5	61·	Calm	Clear, cumuli.	
·184	61·8	65·2	61·	N.W.	Clear, cumuli.	
"	"	"	"	"	"	
·185	65·8	67·	64·	Calm	Clear, cumuli.	
·185	65·5	67·	64·	Calm	Clear, cumuli.	
·184	69·	70·5	64·2	Calm	Clear, cumuli.	
·180	68·	69·	63·5	N.W.	Clear, cumuli.	
·179	67·	68·	64·	Calm	Clear, cumuli.	
·142	69·	68·	65·5	Calm	Clear, cumuli.	3·18
		66·5				
"	"		"	"	"	
·150	66·3	66·5	62·8	Calm	Cloudy.	
·225	65·2	65·8	62·	Calm	Cloudy.	·48
·224	65·	65·5	62·	South	Cloudy.	1·02
·192	65·5	66·5	62·5	S. E.	Clear.	·20
·154	65·8	67·	61·5	S. E.	Clear.	
·177	65·8	67·	61·	S. W.	Clear.	
				S. E.		
"	"	"	"		"	
·168	63·8	64·8	60·5	N. E.	Cloudy.	
·153	67·	69·	65·	N. E.	Clear.	
·144	67·	69·	62·	N. E.	Clear.	
·150	68·	70·	63·	N. E.	Clear.	
·157	67·	69·	64·	N. E.	Clear.	
·128	67·8	70·	65·	N. E.	Cum. strat.	
"	"	"	"	"	"	
·137	67·2	70·5	62·	Calm	Cum. strat.	
·147	67·8	69·	63·5	North	Clear.	
·160	70·2	70·	65·5	N. E.	Cum. strat.	
					Total rain..	6·88

April,

Maximum Pressure, observed at 9*h*. 50*m*. A. M.						
		Temperature.			Wind.	
Days of the Month.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.
1	24·168	67·8	67·5	64·	N. E.	Clear, cumuli.
2	·167	67·5	67·2	64·2	N. E.	Clear, cumuli.
3	·165	67·8	69·	66·	S. E.	Cloudy, nimbi.
4	"	"	"	"	"	"
5	·180	68·	68·5	66·	South	Clear, cumuli.
6	·175	67·8	67·5	65·5	S. E.	Clear, cumuli.
7	·178	67·5	67·8	66·	S. E.	Clear, cumuli.
8	·173	68·5	68.5	66·	South	Clear, cumuli.
9	·177	69·5	69·	65·8	S. E.	Clear, cumuli.
10	·175	68·	68·8	65·2	South	Clear, cumuli.
11	"	"	"	"	"	"
12	·159	68·2	68·5	65·	S. E.	Cloudy.
13	·144	66·	65·8	63·8	S. E.	Cloudy.
14	·140	66·5	66·8	64·5	South	Cloudy, nimbi.
15	·113	65·	64·5	62·	Squally S. E.	Cloudy, mist, drizzle.
16	·099	63·8	63·5	61·	Squally S. E.	Cloudy, mist, drizzle.
17	·023	62·0	62·1	61·7	Squally S. E.	Cloudy, mist, drizzle.
18	·020	62·7	63·	62·	High wind S. E.	Heavy rain.
19	·049	64·2	64·5	62·2	S. E.	Mist and rain.
20	·104	64·5	65·	62·	S. E.	Clear, cumuli.
21	·130	64·	64·8	61·5	South	Clear, cumuli.
22	·125	63·5	63·9	59·	S. W.	Clear, cumuli.
23	·126	64·	65·	58·5	South	Clear.
24						
25						
26						
27						
28						
29						
30						

1847.

Minimum Pressure, observed at 4 p. m.						
Barometer.	Temperature.			Wind.	Aspect of the Sky.	Rain.
	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.		Inches.
24·160	70·5	71·	65·	N. E.	Cloudy, nimbi.	
·160	71·	73·	67·5	S. E.	Cloudy, nimbi.	
·150	69·8	71·5	66·	South	Cloudy.	·02
"	"	"	"	"	"	
·160	71·2	72·5	65·5	S. E.	Clear, cumuli.	
·171	71·	73·	44·5	East	Clear, cumuli.	
·170	71·5	73·2	67·2	South	Clear, cumuli.	·14
·166	71·	72·5	66·	S. E.	Clear, cumuli.	·24
·178	70·	71·8	65·5	South	Clear, cumuli.	
·164	71·	73·	66·	South	Clear, cumuli.	
"	"	"	"	"	"	·32
·134	71·2	73·5	66·	S. E.	Cum. strat.	3·54
·133	68·	69·5	65·	South high	Cloudy, mist.	·10
·135	68·	69·	65·	S. E.	Cloudy, nimbi.	·13
·101	63·8	63·5	61·	South	Cloudy, rain.	1·84
·055	64·	63·2	61·5	Squally S. E.	Rain.	3·97
23·992	63·2	63·2	61·8	Stormy N. E.	Heavy rain.	10·76
24·007	62·7	63·	61·6	S. E.	Mist and rain.	1·50
·040	65·9	67·	63·5	S. W.	Cloudy, nimbi.	
·114	67·	69·	64·	South	Cloudy and rain.	
·126	49·	69·8	65·	S. E. high	Clear.	
·115	67·5	69·	61·5	N. W.	Clear.	
·121	69·	71·	65·8	N. W.	Clear.	
					Total rain..	18·56

June,

MAXIMUM PRESSURE, OBSERVED AT 9*h.* 50*m.* A. M.

Days of the Month.	Barometer.	Temperature. Of the Mercury.	Of the Air.	Of the Wet Bulb.	Wind. Direction.	Aspect of the Sky.
1	24·082	,,	,,	,,	Calm	,,
2	·109	64·5	66·5	64·5	N. E.	Clear, cum.
3	·102	65·	66·2	63·	Calm	Cum. strati.
4	·112	65·	67·	63·	,,	Cumuli.
5	,,	66·5	67·5	64·	,,	Cumuli.
6	,,	,,	,,	,,	,,	,,
7	·104	65·2	66·5	63·5	N. W.	Cumuli.
8	·120	65·2	67·	63·	,,	Clear, cum.
9	·103	64·7	66·2	62·5	,,	Cumuli.
10	·083	64·9	66·	63·9	Calm	Cumuli.
11	·074	66·	66·5	63·5	,,	Cloudy.
12	·060	63·5	64·	61·5	N. W.	Cloudy.
13	,,	,,	,,	,,	,,	,,
14	·046	64·9	65·7	62·	N. W.	Cumuli.
15	·036	64·2	64·7	61·7	N. W.	Cloudy.
16	·035	63·	63·5	60·5	N. W.	,,
17	·023	62·5	66·9	59·	N. W.	,,
18	·020	65·8	67·5	62·	Calm.	Cumuli.
19	·043	66·2	63·5	64·	,,	,,
20	,,	,,	,,	,,	,,	,,
21	·015	64·2	64·5	62·	N. W.	Cloudy, drizzle.
22	·013	64·5	65·	61·2	N. W.	High.
23	23·995	62·2	62·8	60·8	N. W.	Squally.
24	·986	63·	64·	61·2	Calm	Cloudy.
25	24·056	63·8	64·8	61·5	N. W.	,,
26	·019	65·5	66·2	64·	N. W.	Nimbi.
27	,,	,,	,,	,,	,,	,,
28	23·998	63·2	63·5	62·	N. W.	Cloudy.
29	·984	63·8	64·	62·5	N. W.	Cloudy.
30	24·014	65·5	67·7	63·5	N. W.	Cumuli.

1847.

Minimum Pressure, observed at 4 p. m.						
	Temperature.			Wind.		Rain.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
,,	,,	,,	,,	,,	,,	
24·100	67·5	69·5	64·	N. W.	Cirri.	
·098	68·	71·	65·	Calm	Cumuli.	
·110	67·	69·	64·5	S. W.	Cloudy, rain.	0·26
·082	66·	67·	63·	N. W.	Cloudy.	
,,	,,	,,	,,	,,	,,	
·092	66·	67·	63·	N. W.	Cloudy.	
·096	67·	68·5	63·5	N. W.	,,	
·083	66·7	69·5	64·5	N. W.	Cumuli.	
·068	67·	70·	64·	Calm	Cloudy.	
·031	66·	68·	63·5	N. W.	Cloudy.	
·045	64·9	65·	61·5	N. W.	Cloudy.	
,,	,,	,,	,,	,,	,,	
·030	67·	68·5	64·	N. W.	Clear, cum.	
·027	66·2	66·5	63·	N. W.	Cloudy.	
·029	64·5	64·3	60·5	N. W.	,,	
·010	66·5	67·5	62·	N. W.	Cumuli.	
·009	67·5	69·	64·	N. E.	Cloudy.	
·032	68·7	71·	66·	N. W.	Cumuli.	
,,	,,	,,	,,	,,	,,	
·013	66·5	66·8	62·	N. W.	Overcast.	
3·994	64·9	65·2	62·	N. W.	Cloudy.	0·5
·975	63·5	63·8	60·	N.	,,	0·6
·983	64·5	65·	62·	N. W.	,,	0·4
,,	67·	68·	65·	N. W.	,,	
4·014	67·	68·	65·	N. W.	,,	
,,	,,	,,	,,	,,	,,	
3·981	63·9	63·9	61·7	N.	Cloudy.	
·983	65·5	65·5	62·	N. W.	,,	
4·004	67·5	69·2	65·	Calm	,,	
					Total rain..	0·41

July,

Maximum Pressure, observed at 9*h*. 50*m*. A. M.						
Days of the Month.	Barometer.	Temperature.			Wind.	Aspect of the Sky.
		Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	
1	24·038	64·5	65·9	62·5	Calm	Cumuli.
2	·031	65·	66·5	63·	N. W.	Cloudy.
3	·129	65·7	66·9	63·5	,,	,,
4	,,	,,	,,	,,	,,	,,
5	·025	65·5	66·	64·	N. W.	,,
6	·039	65·	66·	61·8	Calm	Cloudy, nimbi.
7	·053	67·	67·5	63·5	N. W.	Cloudy.
8	·058	66·8	67·	63·2	N. W.	Cloudy.
9	·050	65·	66·2	62·	Calm	Nimbi.
10	·045	65·5	66·	61·5	N.	Clear, cum.
11	,,	,,	,,	,,	,,	,,
12	·045	65·5	67·	63·	N. W.	Clear, cum.
13	·052	65·	65·5	62·7	N. W.	Cloudy.
14	·033	64·	64·8	61·5	N. W.	Cloudy.
15	·030	65·9	67·2	62·	N. W.	Clear, cum.
16	·028	66·5	67·	63·5	N. W.	Cloudy.
17	·030	65·	66·	62·5	Calm	,,
18	,,	,,	,,	,,	,,	,,
19	·033	64·5	65·	63·	N. W.	Cloudy.
20	·030	66·2	67·	63·5	N. W.	Clear.
21	·026	65·8	66·2	63·	Calm	Cloudy.
22	·019	63·2	63·8	61·5	N. W.	Squally, cloudy.
23	·015	64·2	64·5	62·5	N.	Cloudy.
24	24·013	65·8	66·5	63·	Calm.	Misty, drizzle.
25	,,	,,	,,	,,	,,	,,
26	·009	63·5	64·	61·5	N. W.	High.
27	·001	64·	64·5	61·	N. W.	Cloudy, misty.
28	·002	65·	66·	62·5	N.	Cloudy.
29	·000	66·	67·	64·	Calm	,,
30	·025	65·	65·5	63·	,,	Misty.
31	·024	61·5	64·8	65·2	N.	Cloudy.

847.

Minimum Pressure, observed at 4 p. m.						
	Temperature.			Wind.		Rain.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
4·019	67·	69·9	64·	N. W.	Cloudy.	
·021	68·5	69·9	65·7	Calm.	,,	
·017	67·	68·2	65·	,,	,,	
,,	,,	,,	,,	,,	,,	
·025	65·	65·2	60·5	N. W.	Light, cloudy.	
·051	67·5	68·	44·5	N. W.	,, ,,	·41
·054	67·8	68·2	62·5	N. W.	,,	
·042	68·2	69·5	64·	N. W.	,, Clear, cum.	
·028	69·	70·5	66·	N. W.	,, Cirri strat.	·20
·036	68·5	69·5	64·	N. W.	,, Cloudy, nimbi.	·74
,,	,,	,,	,,	,,	,,	
·034	66·7	67·2	63·2	S. W.	Cumuli.	
·031	65·9	66·2	62·5	N. W.	Cumuli.	
·024	65·8	66·5	61·5	N.	Cumuli.	
·023	68·5	70·5	64·7	N. W.	Clear, cum.	
·047	67·2	67·5	64·5	Calm.	Cloudy.	
·030	67·	68·5	64·	N. W.	Cumuli.	
,,	,,	,,	,,	,,	,,	
·027	65·8	66·5	66·5	N. W.	Cloudy.	
·025	65·	44·5	63·	N.	Cloudy.	
·019	65·8	44·	43·	N. W.	,,	
·010	66·8	67·2	62·2	N.	,,	·29
·008	65·2	66·8	63·8	N. E.	Cloudy, drizzle.	
·000	67·8	48·	64·5	Calm.	Cloudy.	·46
,,	,,	,,	,,	,,	,,	
·998	45·	65·8	41·5	W.	Cloudy.	
·997	65·	65·5	61·2	N. W.	,,	
·995	66·5	66·	61·8	Calm.	,,	
·009	65·5	66·5	64·	,,	,,	1·04
·010	64·2	44·5	61·	,,	,,	·56
·017	44·8	47·5	,,	N. W.	Light, clear, cum.	
					Total rain..	3·70

August,

Maximum Pressure, observed at 9*h*. 50*m*. a. m.						
Days of the Month.	Barometer.	Temperature.			Wind.	Aspect of the Sky.
		Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	
1	24·008	,,	,,	,,	,,	,,
2	·008	65·	65·7	63·	N. W.	Light, cloudy.
3	·008	65·	65·	63·	,,	,, cloudy.
4	·016	63·8	64·2	61·8	,,	,, cloudy.
5	,,	,,	,,	,,	,,	,,
6	·011	64·5	,,	63·	N. W.	Cloudy.
7	·006	64·5	64·	66·	,,	,,
8	,,	,,	,,	,,	,,	,,
9	·027	63·	63·8	42·	,,	Cloudy, nimbi.
10	·047	64·8	65·2	42·	,,	Clear, cumuli.
11	·073	64·2	65·2	61·8	,,	Cloudy, nimbi.
12	·086	63·8	64·2	61·	Calm	Cloudy, nimbi.
13	·081	63·8	64·	61·5	,,	Clear, cumuli.
14	·066	62·5	62·8	60.	N. W.	High, cloudy.
15	,,	,,	,,	,,	,,	,,
16	·058	64·5	66·2	62·	N. W.	Cumuli.
17	·050	44·8	65·2	43·	N. W.	Light, clear.
18	·080	65·7	65·9	64·	,,	Cloudy.
19	·077	63·9	64·5	61·	,,	Light, cumuli.
20	·081	64·	64·9	61·	,,	Clear, cum.
21	·094	65·	65·	63·	,,	Light, cloudy.
22	,,	,,	,,	,,	,,	,,
23	·076	63·	63·5	62·	Calm.	Cloudy.
24	·072	63·8	64·	62·	,,	Clear, cum.
25	·090	64·3	65·	62·5	N. W.	Cloudy.
26	·083	63·5	63·8	61·	,,	Clear.
27	·081	63·2	63·5	61·5	,,	Cloudy and misty.
28	·080	63·5	66·2	61·5	,,	Clear.
29	,,	,,	,,	,,	,,	,,
30	·081	64·9	66·9	63·	,,	Clear.
31	·068	64·5	65·	62·5	,,	Cloudy.

347.

Minimum Pressure, observed at 4 p. m.

Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of the Wet Bulb.	Wind. Direction.	Aspect of the Sky.	Rain. Inches.
,,	,,	,,	,,	,,	,,	
3·987	66·	66·	63·	N. W.	Light, Cloudy.	·30
·999	66·	63·5	63·5	,,	Cloudy.	
4·001	66·	64·5	64·	,,	,,	
,,	,,	,,	,,	,,	,,	
·006	66·	65·7	63·5	,,	,,	
3·991	64·9	64·5	61·9	,,	,,	
,,	,,	,,	,,	,,	,,	
1·014	65·	65·5	62·	N. W.	High, cloudy.	
·043	65·5	66·	63·	N.	,, cloudy.	
·067	64·8	65·	62·	N. W.	Cloudy, drizzle.	
·081	66·5	68·	63·	N. W.	Cloudy.	
·070	65·5	66·	62·	,,	,,	
·052	64·8	65·	61·	,,	,,	·42
,,	,,	,,	,,	,,	,,	
·060	67·	68·5	64·	N. W.	Cumuli.	
·063	67·5	68·5	64·	,,	,,	
·077	67·	67·	63·5	,,	Cloudy.	
·073	67·4	68·8	64·1	N. W.	Clear, cumuli.	
·080	68·	70·	65·	,,	Light, clear, cum.	
·084	67·	67·5	64·9	Calm	Cloudy.	
,,	,,	,,	,,	,,	,,	1·84
·074	66·8	66·8	62·5	Calm	Cloudy.	·10
·068	65·2	65·2	62·	N. W.	Light, cloudy.	
·076	66·	66·	63·	Calm	Cloudy, drizzle.	
·070	67·2	67·2	62·8	N. W.	Light, clear.	
·072	67·5	67·5	63·	,,	Clear, cumuli.	
·067	68·5	67·	63·	,,	Cloudy, misty.	
,,	,,	,,	,,	,,	,,	
·064	66·5	67·5	64·	N. W.	Cloudy.	
·054	67·2	68·5	64·	,,	Cloudy.	
					Total rain . .	2·66

September,

Maximum Pressure, observed at 9*h.* 50*m.* A. M.						
		Temperature.			Wind.	
Days of the Month.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.
1	24·066	65·	66·5	63·	N. W.	Cloudy.
2	·079	65·	66·2	63·5	,,	Clear, cumuli.
3	·085	65·9	66·3	62·5	,,	Cloudy.
4	·077	64·9	65·3	62·	,,	Cloudy.
5	,,	,,	,,	,,	,,	,,
6	·058	62·	63·	60·	N. W.	High, clear.
7	·022	62·9	63·9	60·9	,,	,, cloudy.
8	·004	63·5	64·2	61·	,,	Clear, cumuli.
9	23·991	63·5	64·	61·	,,	,,
10	24·020	65·2	65·5	62·5	,,	,,
11	24·025	65·	65·8	62·5	W.	,,
12	,,	,,	,,	,,	,,	,,
13	·027	64·5	65·5	61·5	W.	Clear, cumuli.
14	·035	66·	67·	63·2	N. W.	Light, cloudy.
15	·047	66·5	67·	64·	Calm.	Cloudy,
16	·035	66·5	66·9	64·	N. W.	Light, cloudy.
17	·055	66·	66·5	64·	Calm	,,
18	·052	64·5	64·9	62·	N. W.	Light, clear.
19	,,	,,	,,	,,	,,	,,
20	·105	62·5	63·	60·8	Calm	Cloudy, nimbi.
21	·101	63·2	63·5	61·5	N. W.	Light.
22	·080	63·5	64·	62·2	,,	,, clear, cum.
23	·126	60·5	64·	62·	Calm	Cumuli strati.
24	·109	61·7	61·7	57·5	,,	Cloudy.
25	·100	63·8	63·	62·7	N. W.	Light, cumuli.
26	,,	,,	,,	,,	,,	,,
27	·101	64·	64·7	62·	Calm	Cloudy.
28	·096	64·	63·5	62·	,,	,,
29	·158	64·	64·2	61·9	N. W.	,,
30	·102	64·	64·7	60·5	,,	Light, cumuli.

1847.

Minimum Pressure, observed at 4 p. m.						
	Temperature.			Wind.		Rain.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
24·066	67·7	68·7	65·	N. W.	Cumuli.	
·070	67·	67·8	65·	,,	Cloudy.	
·076	67·5	68·2	65·	,,	,,	
·175	67·2	68·2	65·	N.	Clear, cum.	
,,	,,	,,	,,	,,	,,	
·024	65·	65·2	42·	N. W.	Cloudy.	
23·999	64·5	64·9	61·	,,	,,	
·987	66·2	68·	63·5	,,	Nimbi.	
·992	67·8	48·9	64·	,,	Clear, cum.	
24·000	66·8	68·	63·	,,	Cloudy.	
·000	67·	68	63·5	N.	,,	
,,	,,	,,	,,	N. W.	Clear, cum.	
·011	67·5	68·8	63·	N. W.	,,	
·021	68·2	66·9	64·	,,	Cumuli.	
·042	67·5	67·7	64·	,,	,,	
·043	67·7	68·5	64·	,,	,,	
·035	66·5	66·9	63·5	,,	,,	
·111	66·2	67·7	63·	,,	Clear, cumuli.	
,,	,,	,,	,,	,,	,,	
·115	67·	68·	65·	Calm	,,	
·099	67·	67·5	66·5	,,	Cloudy.	·21
·083	67·8	68·5	64·8	,,	,,	1·01
·086	67·	67·5	61·5	N. W.	Clear, cumuli.	
·097	65·	67·5	62·	,,	,,	
·098	64·5	61·7	61·	,,	,,	
,,	,,	,,	,,	,,	,,	
·086	66·5	67·7	63·5	Calm	Cloudy, nimbi.	0·14
·077	66·9	67·2	63·5	,,	Cloudy.	
·183	66·2	66·5	63·5	,,	,,	
·067	66·7	68·5	64·	N. W.	Cumuli.	
					Total rain . .	1·36

October,

Maximum Pressure, observed at 9*h.* 50*m.* A. M.						
		Temperature.			Wind.	
Days of the Month.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.
1	24·069	64·	66·	60·	N. W.	Lt. clear cumuli.
2	0·85	64·7	65·7	62·2	,,	,, cumuli.
3	,,	,,	,,	,,	,,	,,
4	·101	65·5	66·2	63·	Calm	Cloudy.
5	·137	66·2	66·	64·	,,	Cumuli.
6	·120	64·2	64·5	61·	N. W.	Lt. clear cumuli.
7	·128	63·5	63·8	61·5	Calm	Clear.
8	·138	64·2	64·5	62·	,,	,,
9	,,	,,	,,	,,	,,	,,
10	,,	,,	,,	,,	,,	,,
11	·141	63·2	63·5	61·8	Calm	Cloudy.
12	·131	65·	65·	63·	,,	Cumuli.
13	·125	65·5	65·9	63·	,,	Cloudy.
14	·092	61·5	61·8	60·5	N. E.	Cloudy drizzle.
15	·049	62·	62·2	60·5	,,	Cloudy.
16	·061	62·5	62·8	61·	N. E.	Heavy mist & driz.
17	,,	,,	,,	,,	,,	,,
18	·103	63·5	64·2	62·5	Calm	Cloudy mist.
19	·080	64·2	66·5	62·5	,,	Cloudy.
20	·131	64·8	64·5	62·	,,	,,
21	·151	64·3	64·3	62·5	,,	,,
22	·169	64·	64·2	62·	,,	,,
23	·171	65·	64·2	62·	Calm	Misty.
24	·159	,,	,,	,,	,,	,,
25	·166	64·5	64·2	62·9	,,	Cumuli.
26	·158	64·5	65·	63·	,,	Cloudy.
27	·156	65·	65·2	63·7	,,	Cumuli.
28	·121	64·7	64·9	63·9	N. E.	Cumuli.
29	·121	61·2	62·	59·	,,	,,
30						
31						

1847.

Minimum Pressure, observed at 4 p. m.						
	Temperature.			Wind.		Rain.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
24·059	65·2	66·5	61·5	N. W.	Lt. clear cumuli.	
·070	65·8	66·8	63·5	Calm	Cloudy.	
,,	,,	,,	,,	,,	,,	
·125	67·2	68·5	65·	,,	,,	0·54
·119	67·8	68·	65·5	,,	Cumuli.	·22
·097	64·	66·2	63·5	,,	Cloudy.	
·112	65·5	65·8	62·5	N. W.	Clear.	·18
,,	,,	,,	,,	,,	,,	·53
,,	,,	,,	,,	,,	,,	
,,	,,	,,	,,	,,	,,	
·099	67·	68·5	64·5	Calm	Cloudy.	·50
·114	68·5	70·	66·	,,	,,	·82
·091	65·9	65·9	62·	,,	,,	·14
·020	60·	59·3	57·	N. E.	,,	·82
·034	65·	65·5	63·5	Calm	,,	·16
·059	66·9	68·7	64·	,,	Cumuli.	·16
,,	,,	,,	,,	,,	,,	
·073	65·8	66·2	63·8	,,	Cloudy.	·08
·081	67·2	68·	66·2	,,	,,	·85
·113	66·2	66·5	64·	,,	,,	·88
·131	64·3	64·5	62·	Calm	Dense mist.	
·142	66·5	67·2	64·	,,	Cloudy.	·20
·145	66·7	67·5	66·5	,,	,,	4·34
,,	,,	,,	,,	,,	,,	
·131	66·3	66·7	64·	,,	,,	·30
·134	66·5	67·	64·5	,,	,,	
·126	67·5	68·9	65·	,,	Cumuli.	·09
·125	65·5	64·5	61·5	N. E.	Lt. Cloudy.	
·123	64·	65·	61·	,,	Cumuli.	·42
						·24
						·86
					Total rain . .	12·33

November

MAXIMUM PRESSURE, OBSERVED AT 9*h*. 50*m*. A. M.

Days of the Month.	Barometer.	Temperature. Of the Mercury.	Of the Air.	Of the Wet Bulb.	Wind. Direction.	Aspect of the Sky.
1	24·150	63·5	64·	61·	N. E.	Light, cloudy, fog.
2	·141	62·2	62·5	60·	N. E.	Cloudy, mist.
3	·139	62·	62·2	60·	,,	Heavy mist and rain.
4	·140	63·9	64·	62·5	Calm	Clear, cumuli.
5	·168	64·2	64·5	61·8	,,	Cloudy.
6	·160	63·	63·5	62·	,,	Cloudy.
7	,,	,,	,,	,,	,,	,,
8	·131	63·	63·9	62·	Calm	Cloudy.
9	·135	61·5	62·5	60·	,,	Cloudy.
10	·135	62·3	62·3	60·	N. E.	Light, cumuli.
11	·154	63·	63·	61·	,,	Light, cumuli.
12	·161	62·5	62·8	60·9	Calm	Cloudy, drizzle.
13	·155	63·2	63·2	61·	,,	Cloudy.
14	,,	,,	,,	,,	,,	,,
15	·157	59·8	60·	58·	N. E.	Clear, cumuli.
16	·140	57·	56·5	53·	,,	Clear.
17	·133	59·5	59·8	56·5	Calm	,,
18	·138	60·5	61·5	57·5	Calm	Clear, cumuli.
19	·151	62·	62·5	60 5	Calm	Cloudy.
20	·145	62·5	62·9	60·5	,,	Cloudy.
21	,,	,,	,,	,,	,,	,,
22	·148	62·5	62·5	60·	N. E.	Light, clear.
23	·150	61·8	62·5	60·	Calm	Cloudy.
24	·153	63·2	64·2	61·2	,,	Clear, cum.
25	·153	64·	64·5	62·	,,	Cloudy.
26	·157	63·5	63·9	62·	,,	,,
27	·150	64·7	64·7	62·7	,,	Cumuli.
28	,,	,,	,,	,,	,,	,,
29	·144	64·2	44·2	62·	Calm	Cumuli.
30	·151	64·	44·2	62·	,,	Clear, cum.
31						

1847.

Minimum Pressure, observed at 4 p. m.						
	Temperature.			Wind.		Rain.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
24·132	64·	64·	61·	Calm.	,,	1·93
·133	65·	66·	62·8	,,	,,	1·08
·081	63·	63·2	61·5	N. E.	High.	1·75
·133	66·5	66·	63·5	Calm.	,,	1·06
·158	66·2	66·5	63·	,,	,,	·30
·134	64·	65·2	62·5	Clr. E.	Cloudy, drizzle.	0·43
,,	,,	,,	,,	,,	,,	
·105	64·5	65·2	62·	Calm	Cumuli.	
·120	63·	63·7	60·	,,	Cloudy.	
·124	64·	65·	62·	N. E.	Light, cumuli.	
·141	65·3	66·9	63·	,,	Light, cloudy.	
·144	64·	66·5	62·	Calm	Cloudy.	·47
·152	64·2	64·5	62·	,,	Heavy mist.	
,,	,,	,,	,,	,,	,,	
·145	62·5	63·	59·	N. E.	Clear, cum.	
·120	62·2	63·5	53·8	N. E.	Light, clear.	
·111	61·8	63·	58·5	Calm	Cloudy.	
·129	63·5	65·	60·5	N. E.	Light, cumuli.	
·140	63·	66·8	60·8	Calm	Cloudy.	
·128	63·9	62·7	60·	N. E.	Rain.	·14
,,	,,	,,	,,	,,	,,	
·132	64·5	66·	62·	Calm	Clear, cum.	
·146	64·5	65·5	62·	,,	Cloudy.	·41
·131	65·	66·3	63·5	,,	Cloudy, drizzle.	·92
·130	65·5	66·5	64·	,,	Cloudy.	·12
·131	65·5	66·2	64·	,,	,,	
·132	65·7	66·	64·	,,	Cumuli.	·94
,,	,,	,,	,,	,,	,,	
·132	66·5	66·5	63·5	Calm	Cloudy.	·51
·130	65·	65·5	,,	,,	Cloudy.	·19
						·37
					Total rain . .	10·62

December,

Days of the Month.	Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of the Wet Bulb.	Wind. Direction.	Aspect of the Sky.
	Maximum Pressure, observed at 9*h*. 50*m*. A. M.					
1	24·138	61·	61·2	58·2	......	Calm, mist and rain.
2	·126	62·2	62·5	61·	......	Calm, cloudy.
3	·108	62·5	62·8	60·5	......	N. E. rain.
4	·101	62·8	63·	60·2	......	Calm, cloudy.
5	"	"	"	"	"	"
6	·129	62·8	62·	61·	......	Calm, cloudy, drizzle.
7	·136	62·7	62·2	61·	......	N. E. cumuli.
8	·132	62·5	62·	61·	......	Calm, cloudy.
9	·134	62·	62·	60·	......	"
10	·080	57·2	58·	51·	......	N. E. cumuli.
11	·070	58·5	59·	56·	......	N. E. clear.
12	"	"	"	"	"	"
13	·196	58·9	59·5	57·	......	N. E. cloudy.
14	·194	59·5	59·8	57·8	......	Calm, cloudy, mist.
15	·046	58·9	59·	58·	......	" clear, cumuli.
16	·081	59·	69·5	57·8	......	" nimbi.
17	·063	59·5	60·2	55·	......	" cloudy, mist.
18	·080	61·5	62·	59·	......	" cloudy.
19	"	"	"	"	"	" cloudy.
20	·125	62·5	62·2	61·	......	" cumuli.
21	·137	62·5	62·7	61·	......	" cloudy, drizzle.
22	·134	63·	62·7	61·	......	" cumuli.
23	·137	61·5	61·	57·8	......	" cumuli.
24	·136	58·5	57·7	55·5	......	" "
25	"	"	"	"	"	" "
26	"	"	"	"	"	" "
27	·135	59·5	59·5	57·8	Calm	Cloudy.
28	·140	59·	60·	58·8	N. E.	Clear, cumuli.
29	·181	59·2	59·5	57·7	Calm	Cloudy.
30	·175	59·5	59·8	57·	"	Clear.
31						

1847.

MINIMUM PRESSURE, OBSERVED AT 4 P. M.

Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of the Wet Bulb.	Wind. Direction.	Aspect of the Sky.	Rain. Inches.
·119	65·	65·5	62·5	N. E.	Lt. Clear.	·01
·090	63·9	63·5	61·5	Calm	Cloudy.	·53
·085	63·5	63·8	61·	N. E.	Lt. Cloudy.	·35
·077	64·5	64·8	62·	Calm	Cloudy.	2·56
,,	,,	,,	,,	,,	,,	·64
·125	64·5	63·7	62·	Calm	Cloudy, drizzle.	·21
·122	64·5	65·	62·5	N. E.	Lt. cumuli.	
·137	64·5	64·2	62·	Calm.	Cloudy.	
·118	63·9	65·	61·	,,	Cloudy.	
·053	59·	60·	53·	N. E. Lt.	Cumuli.	
·051	58·5	60·	52·8	N. E. Lt.	Clear.	
,,	,,	,,	,,	,,	,,	·99
·016	60·	60·	57·	N. E. Lt.	Cloudy.	·19
·005	60·2	60·5	58·5	Calm	Cloudy, mist.	·03
·034	62·	63·	60·5	,,	Clear, cumuli.	
·059	62·5	63·	60·5	,,	Nimbi.	·21
·062	63·	64·	61·8	,,	Cloudy, mist.	·59
·077	64·	65·	62·8	,,	Cloudy.	·76
,,	,,	65·2	,,	,,	,,	1·00
·130	64·5	64·	62·	Calm	Cumuli.	
·126	63·9	65·2	62·	,,	Cloudy, drizzle.	·07
·128	65·	62·	63·	,,	Cloudy.	
·123	62·5	62·	60·	,,	Cumuli.	
,,	,,	,,	,,	,,	,,	
,,	,,	,,	,,	,,	,,	
,,	,,	,,	,,	,,	,,	
·126	61·8	62·	59.8	,,	Cloudy.	1·01
·135	60·5	61·	58.8	N. E. Lt.	Clear, cumuli.	·42
·180	61·8	62·5	60	Calm	Cloudy.	
·148	62·5	63·	61·8	,,	Clear.	
					Total rain . .	9·57

METEOROLOGICAL

(January, 1847.*)* *Kept at the Survey Office.*

Maximum Pressure, observed at 9h. 50m. a. m.						
Days of the Month.	Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of the Wet Bulb.	Wind. Direction.	Aspect of the Sky.
1	,,	,,	,,	,,	,,	Squally.
2	24·252	60·	60·5	57·	N. W.	Nearly mid.
3	,,	,,	,,	,,	Slight North	,,
4	24·214	61·2	61·5	58·	N. W.	Clear cumuli.
5	·205	55·8	57·	54·5	Slight North	Clear cumuli.
6	,,	,,	56·	53·6	Calm	Clear cumuli.
7	,,	,,	58·	55·8	N. W.	Clear cumuli.
8	·232	61·	59·	57·	N. W.	Clear cumuli.
9	·167	57·3	57·5	54·	Calm	Clear cumuli.
10	,,	,,	,,	,,	,,	,,
11	·160	16·0	57·2	54·5	Calm	Clear cumuli.
12	·151	55·8	56·	52·	Calm	Clear cumuli.
13	·169	58·	59·	54·	Calm	Clear.
14	·160	58·2	58·5	53·5	Calm	Clear.
15	·169	58·2	58·5	55·	Calm	Clear.
16	·169	58·5	58·2	55·5	Calm	Clear.
17	,,	,,	,,	,,	,,	,,
18	·160	58·2	58·5	54·5	N. W.	Clear.
19	·170	56·5	56·8	53·5	North	Clear.
20	·160	57·6	57·8	54·	North	Clear.
21	·160	59·	59·2	55·5	Calm	Clear.
22	·159	59·2	,,	56·	North	Clear.
23	·158	59·8	,,	56·	Calm	Clear.
24	·160	59·5	,,	56·	Calm	Clear.
25	·144	58·2	,,	53·5	Calm	Clear.
26	·106	61·5	,,	55·8	Calm	Clear.
27	·102	61·5	,,	56·	Calm	Clear.
28	·123	62·5	,,	58·5	Calm	Clear.
29	·107	64·8	,,	62·5	Calm	Clear.
30	·099	63·8	,,	61·	Calm	Clear.
31	,,	,,	,,	,,	,,	,,

REGISTER,

KOTERGHERRY, *for the Year* 1847.

MINIMUM PRESSURE, OBSERVED AT 4 P. M.						
	TEMPERATURE.			WIND.		RAIN.
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction.	Aspect of the Sky.	Inches.
”	”	”	”	”	”	·30
24·200	61·5	61·8	58·2	Squally North	Heavy mist.	·41
”	”	”	”	”	”	1·04
·201	61·2	62·5	59·2	Slight North	Clear cumuli.	
·185	60·5	62·2	58·5	Calm	Clear cumuli.	
”	”	62·8	58·5	Calm	Clear cumuli.	
”	”	63·5	57·5	N. W.	Clear cumuli.	
·150	61·	63·	56·	Calm	Clear cumuli.	
·140	62·5	63·8	58·	Calm	Clear cumuli.	
”	”	”	”	”	”	
·155	64·	66·	59·	Calm	Clear cumuli.	
·153	63·8	65·8	59·	Calm	Clear.	
·168	64·5	66·	61·	Calm	Clear.	
·158	64·	65·	58·	Calm	Clear.	
·157	63·5	65·5	58·5	Calm	Clear.	
”	”	”	”	”	”	
”	”	”	”	”	”	
·159	61·2	62·5	56·5	Slight North	Clear.	
·166	62·2	63·2	58·	N. W.	Clear.	
·145	63·5	64·8	59·5	Calm	Clear.	
·143	63·8	”	56·	Calm	Clear.	
·153	64·	”	58·	North	Clear.	
·154	63·	”	58·	Calm	Clear.	
·158	64·5	”	59·	Calm	Clear.	
·120	62·	”	59·	Calm	Clear.	
·080	67·8	”	61·	Calm	Clear.	
·090	66·8	”	61·	Calm	Clear.	
·087	68·8	”	66·	Calm	Clear.	
·103	68·8	”	62·	Calm	Clear.	
·078	67·5	”	60·	Calm	Clear.	
”	”	”	”	”	”	
					Total rain . .	1·7

Meteorological Register kept at the Survey Office,

Days of the Month.	At Sunrise. Barometer.	At Sunrise. Temperature. Of the Mercury.	At Sunrise. Temperature. Of the Air.	At Sunrise. Temperature. Of the Wet Bulb.	Direction of Wind about 6 A. M.	Maximum Pressure, at 9*h.* 50*m.* A. M. Barometer.	Max. Pressure. Temperature. Of the Mercury.	Max. Pressure. Temperature. Of the Air.	Max. Pressure. Temperature. Of the Wet Bulb.	Max. Pressure. Direction of Wind.	At Apparent Noon. Barometer.	At Apparent Noon. Temperature. Of the Mercury.	At Apparent Noon. Temperature. Of the Air.	At Apparent Noon. Temperature. Of the Wet Bulb.	At Apparent Noon. Direction of Wind.	Aspect of the Sky at Noon.
		°	°	°			°	°	°			°	°	°		
1	23·037	55·	53·5	52·5	W.S.W.	23·059	61·	60·5	58·	S. W.	23·113	66·75	67·	62·	Calm	Cloudy, cumuli.
2	·067	56·	53·	52·	Calm	·101	62·5	62·	60·	,,	·104	64·	64·5	63·	,,	,, nimbi.
3	·103	56·3	56·	55·	,,	·130	62·	61·4	59·	,,	·117	65·75	66·25	62·	,,	,, cumuli.
4	·095	57·	54·	53·5	,,	·138	61·	60·7	58·	,,	·111	64·5	64·5	60·5	,,	Cumuli, strati.
5	·071	56·2	54·	54·	N. W.	·113	60·5	60·2	57·	,,	·112	64·2	63·7	60·	N.	,, ,,
6	·051	55·	53·	52·	Calm	·087	62·5	61·	54·	,,	·092	65·5	62·75	57·	Calm	,, ,,
7	·001	56·	52·	51·	,,	·012	58·	57·8	55·	W.	·003	59·6	60·	56·	S. W.	Mist and rain.
8	·020	53·	51·8	50·	W.	·038	58·5	58·6	54·2	,,	·014	61·5	61·75	57·	,,	Cumuli.
9	·047	55·	52·	52·	Calm	·111	64·	62·5	59·	Calm	·113	66·75	65·5	60·	Calm	Cum. & nimbi.
10	·081	51·5	51·4	50·5	,,	·136	61·5	60·2	56·	,,	·131	64·75	65·75	59·	,,	,, ,,
11	·048	54·	52·	51·5	,,	·236	66·7	61·5	57·	,,	·161	68·5	70·25	59·	S. W.	,, ,,
12	·111	54·5	51·	48·	,,	·143	65·5	66·5	56·5	,,	·155	73·3	73·5	59·	Calm	,, and strati.
13	·093	57·	54·	53·	,,	·139	65·3	67·	58·5	,,	·137	66·5	67·5	60·5	,,	Cloudy.
14	·130	54·	53·	52·5	,,	·194	69·	65·	61·7	N. E.	·173	67·	65·	61·5	S. W.	Cumuli.
15	·151	58·	55·5	55·	,,	·155	64·6	61·8	60·	Calm	·176	66·5	70·25	62·75	Calm	Cloudy.
16	·159	57·	55·	54·	,,	·169	64·5	61·5	59·7	,,	·154	62·	65·	61·	,,	Drizzle.
17	·154	54·	51·	49·	,,	·178	63·5	61·25	61·	,,	·189	68·5	72·75	65·	,,	Nimbi.
18	·160	53·	49·5	48·	,,	·182	62·75	66·	58·	,,	·184	67·5	72·5	64·	,,	Cum. & nimbi.
19	·131	50·7	50·	49·	,,	·159	64·75	66·75	61·	,,	·156	65·	64·5	60·5	,,	Cloudy.
20	·103	56·2	55·	53·	,,	·130	63·99	61·99	60·	,,	·129	66·99	65·25	61·	,,	Cum. & nimbi.
21	·104	56·5	55·2	53·5	,,	22·986	60·5	61·4	60·2	,,	·002	61·7	62·8	60·2	,,	Cumuli.
22	·133	58·0	57·8	54·8	,,	23·160	62·75	61·25	59·	,,	·150	65·5	64·	59·5	,,	Cloudy.
23	·098	58·75	58·75	55·9	,,	·122	65·5	63·25	61·	,,	·112	68·	66·	63·25	,,	,, nimbi.
24	·043	55·	54·	53·6	,,	·102	64·	61·	60·75	,,	·098	67·5	62·25	61·	,,	Clear, cumuli.
25	·084	57·	55·	54·	,,	·136	62·	60·5	61·	,,	·133	67·	63·5	63·	,,	Clear, ,,
26	22·980	58·	55·	53·6	,,	·083	65·75	62·	63·	,,	·064	67·75	67·75	61·5	,,	Cloudy, nimbi.
27	·980	60·	56·0	54·5	,,	·150	75·25	64·25	63·75	,,	·137	68·	66·25	63·	,,	Clear, cum.
28	·981	61·	58·	56·5	,,	22·982	62·8	63·5	62·4	N. E.	22·986	63·	65·3	63·5	E.	Cumuli.
29	·960	57·5	56·9	55·	,,	23·160	62·80	62·1	60·3	Calm	23·151	66·9	65·2	62·	Calm	Cum. & nimbi.
30	·958	57·7	56·6	54·6	N. E.	·121	64·5	63·5	60·	,,	22·129	67·5	66·5	60·75	,,	,,

Ootacamund, for the Month of September, 1845.

AT 2*h.* 40*m.*					MINIMUM PRESSURE, AT 4*h.* P. M.					AT SUNSET.					RAIN GUAGE.
	TEMPERATURE.					TEMPERATURE.					TEMPERATURE.				
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction of Wind.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction of Wind.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction of Wind.	Inches.
	°	°	°			°	°	°			°	°	°		
23·105	66·5	67·	66·	N. E.	23·112	62·5	65·	62·	W.	23·118	59·5	63·	57·	W.	
·093	63·	64·5	61·	Calm	·092	64·3	65·5	60·	Calm	·095	59·5	62·	58·	Calm	
·117	63·	65·	61·	,,	·097	62·4	64·	60·5	,,	·101	59·	62·5	58·	S. W.	
·004	67·3	67·	62·	N. E.	·099	67·	67·6	62·	N. W.	·081	60·5	63·	58·5	W.	
·085	67·	67·5	60·	N. W.	·078	66·5	66·8	60·5	,,	·091	60·	65·	59·	N.	
·077	70·5	68·5	58·	,,	·025	63·8	58·5	57·5	N.	·082	59·5	61·3	56·	W.	
22·990	58·5	59·5	56 5	W.	22·971	57·	66·5	56·	S. W.	22·977	56·5	56·5	53·5	S.	·04
·032	64·25	64·	57·75	N. N.	23·032	67·	64·	57·5	N. W	23·020	55·5	59·	54·	Calm	
·090	63·75	65·	61·	Calm	·053	62·	63·	59·	Calm	·047	56·7	61·	56·	,,	
·102	63·75	65·5	59·	,,	·100	63·	64·7	58·	,,	·105	58·5	61·2	57·2	,,	
·120	65·5	66·5	59·	,,	·095	64·3	66·2	58·	,,	·093	58·5	62·	55·	,,	
·092	65·5	67·7	61·	,,	·089	65·	63·5	61·	,,	·080	60·5	63·5	59·	,,	
·126	68·	67·5	64·3	S. W.	·104	63·4	64·	59·	W.	·098	60·2	62·	57·	S. W.	
·161	67·	68·	65·4	W.	·124	63·5	64·	61·	S. W.	·085	60·	61·7	57·	Calm	
·147	65·5	70·5	60·5	Calm	·145	63·	62·5	60·5	Calm	·101	61·	61·5	59·	,,	
·122	62·33	64·	60·	,,	·163	62·	63·3	59·5	,,	·145	61·	61·	59·	,,	·92
·174	61·5	63·5	62·	,,	·156	62·	66·	60·	,,	·180	62·	60·	58·	,,	·10
·163	68·99	65·5	64·	,,	·167	67·	63·5	61·5	,,	·178	58·	60·	58·3	,,	
·116	61·5	63·75	60·75	,,	·143	62·	63·5	60·	,,	·004	59·	61·2	58·	,,	
·114	68·5	68·33	60·75	,,	·110	67·75	67·25	60·5	,,	·008	58·	60·4	56·6	,,	
·005	62·	62·6	59·4	,,	·000	62·	62 6	59·8	,,	·088	61·25	61·	58·4	,,	·80
·104	63·	63·5	59·75	,,	·082	61·75	61·75	59·	W.	22·970	59·25	61·3	58·9	,,	·72
·070	67·5	67·25	62·	,,	·077	64·	65·	62·4	,,	23·031	60·5	61·5	58·6	,,	·30
·081	69·	64·75	62·	,,	·070	66·5	64·5	62·0	,,	22·990	59·	61·0	58·5	,,	·12
·100	70·	64·75	63·5	,,	·074	65·	63·25	61·3	,,	·988	61·	62·5	59·4	,,	·16
·082	66·75	66·5	61·5	,,	·076	61·5	64·75	62·8	,,	·992	62·	64·0	61·4	,,	·12
·095	65·5	66·5	62·	,,	·072	63·25	63·5	61·	Calm	·992	60·5	63·9	60·3	,,	·24
·991	62·8	65·6	62·	,,	22·982	61·	63·0	60·4	N. E.	978	60·7	62·0	58·0	,,	1·24
23·072	64·75	65·5	61·2	,,	·988	62·	63·0	60·1	,,	·995	60·2	63·5	59·0	,,	·01
·114	67·5	68·	61·75	,,	·984	61·2	63·1	60·2	,,	·982	60·5	64·0	60·1	,,	·69
											Total rain, inches....				5·46

Meteorological Register kept at the Survey Office,

Days of the Month.	AT SUNRISE. Barometer.	AT SUNRISE. Temperature. Of the Mercury.	AT SUNRISE. Temperature. Of the Air.	AT SUNRISE. Temperature. Of the Wet Bulb.	AT SUNRISE. Direction of Wind about 6 A. M.	MAXIMUM PRESSURE, AT 9*h*. 50*m*. A. M. Barometer.	MAXIMUM PRESSURE. Temperature. Of the Mercury.	MAXIMUM PRESSURE. Temperature. Of the Air.	MAXIMUM PRESSURE. Temperature. Of the Wet Bulb.	MAXIMUM PRESSURE. Direction of Wind.	AT APPARENT NOON. Barometer.	AT APPARENT NOON. Temperature. Of the Mercury.	AT APPARENT NOON. Temperature. Of the Air.	AT APPARENT NOON. Temperature. Of the Wet Bulb.	AT APPARENT NOON. Direction of Wind.	Aspect of the Sky at Noon.
		°	°	°			°	°	°			°	°	°		
1	24·040	60·	66·8	56·4	N. W.	24·048	66·	66·5	63·	W.	24·057	67·3	68·5	64·	N. W.	Cum. strati.
2	·089	60·7	60·	56·	,,	·100	65·5	66·	63·	Calm	·095	68·5	69·	65·	,,	,,
3	·047	58·3	59·1	59·2	Calm	·060	66·	66·2	63·	,,	·050	69·2	69·5	64·	,,	Clear, cum.
4	·050	59·4	60·3	57·	,,	·071	65·5	66·2	62·5	,,	·059	66·	68·8	63·5	Calm	Very misty.
5	·046	59·	60·	56·8	W.	·070	67·	65·5	61·5	N. W.	·081	70·5	70·8	62·	,,	Nimbi.
6	,,	,,	,,	,,	,,	·068	64·4	65·4	61·3	W.	·072	69·0	69·3	62·4	W.	Cumuli.
7	·014	59·2	60·	56·6	W.N.W.	·042	68·5	69·	64·	W.	·046	69·	68·8	64·	W.	,,
8	,,	,,	,,	,,	,,	·065	65.5	66·6	64·	N. W.	·089	68·	68·	63·	W.	Cum. strati.
9	·071	59·	60·	56·	N. W.	23·982	65·2	66·	59·5	,,	·080	68·5	69·5	63·5	N. W.	Clear.
10	·041	58·7	58·5	54·3	N.	24·077	67·	67·2	59·8	,,	·070	68·2	68·6	63·	Calm	Clear, cum.
11	·140	59·8	59·	55·	Calm	·165	67·5	68·	61·6	,,	·140	64·	65·5	60·5	,,	Cloudy, nimbi.
12	,,	,,	,,	,,	,,	·116	66·5	66·8	61·	,,	·126	68·	69·6	61·	W.	Clear, cum.
13	·057	59·4	59·5	56·6	N.N.W.	·095	65·3	65·5	60·5	Calm	·093	66·	67·	59·7	N.	Cloudy.
14	·055	59·5	60·	56·2	N.	·096	65·2	65·5	61·	N. W.	·120	69·5	70·	64·8	N. W.	Clear, cum.
15	·098	59·	59·8	56·7	N. W.	·109	66·8	67·2	59·2	N. W.	·118	70·	70·5	61·	N. W.	Clear.
16	·084	60·	60·5	56·4	Calm	·135	64·9	66·	60·8	N.	·160	69·6	69·8	64·2	Calm	Cirri strati.
17	·071	59·6	60·	57·	,,	·092	67·	68·8	64·8	Calm	·102	65·	67·	63·	N. W.	Cloudy, nimbi.
18	,,	,,	,,	,,	,,	·221	66·	67·8	61·5	,,	·181	68·2	68·	63·5	N.	Clear, cum.
19	·147	59·4	60·	55·	N.	·195	66·	67·5	61·	N. W.	·170	67·5	69·	61·5	N.	,,
20	·140	58·5	59·2	54·	N. W.	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
21	·137	59·	59·7	54·8	Calm	·160	66·3	65·2	62·	N. W.	·132	66·7	67·7	61·7	N. W.	Cum. strati.
22	·086	59·3	60·	57·	,,	·164	66·	63·7	59·9	,,	·166	68·3	68·7	60·	,,	Clear, cum.
23	·047	60·	60·4	57·5	,,	·080	64·9	63·5	59·	,,	·133	68·7	69·5	60·	,,	Cum. strati.
24	·046	59·4	59·8	57·1	,,	·194	66·5	66·5	63·	Calm	·157	67·	68·	62·5	Calm	Cumuli.
25	·140	58·8	59·	56·2	N.	·200	67·2	66·7	62.5	,,	·193	64·	66·	62·	,,	Cloudy drizzle.
26	,,	,,	,,	,,	W.	,,	,,	,,	,,	,,	·198	,,	,,	,,	,,	,,
27	·146	57·4	58·2	56·4	Calm	·194	66·8	67·	64·5	,,	·170	68·	68·7	65·	,,	Cloudy, nimbi.
28	·142	58·2	58·1	55·1	,,	·193	65·5	66·2	62·2	,,	·189	67·8	68·8	65·7	,,	Cum. strati.
29	·146	60·	60·	57·	,,	·197	68·2	68·8	64·2	N. W	·180	70·5	71·8	67·	,,	,,
30	·140	58·9	59·2	56·4	,,	·164	68·	68·7	64·	Calm	·180	68·5	70·2	65·5	,,	Clear, cum.

Kotagherry, for the Month of September, 1846.

AT 2*h.* 40*m.*					MINIMUM PRESSURE, AT 4*h.* P. M.					AT SUNSET.					RAIN GUAGE.
	TEMPERATURE.					TEMPERATURE.					TEMPERATURE.				
Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction of Wind.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction of Wind.	Barometer.	Of the Mercury.	Of the Air.	Of the Wet Bulb.	Direction of Wind.	Inches.
	°	°	°			°	°	°			°	°	°		
24·005	62·9	65·	61·	W.	23·966	61·	61·8	59·	W. N. W.	24·036	59·2	60·3	58·	W.	·12
·083	70·5	72·	67·	N. W.	24·067	63·5	65·	66·5	N. W.	·082	60·4	62·	57·8	N.	
23·990	67·2	69·	65·2	,,	·059	67·2	68·7	66·	,,	·075	61·1	62·	57·6	,,	
24·064	65·5	66·	63·5	,,	·040	64·9	66·	62·	,,	·056	61·2	62·	58·	Calm	·18
·062	70·	70·5	62·	,,	·030	63·0	64·2	61·8	,,	·047	61·	62·	57·	N. W.	·08
·056	68·	69·2	61·	Calm	·048	66·2	67·1	,,	W.	·041	60·	61·	58·3	W.	
·026	69·8	70·	65·5	,,	·016	68·	70·2	62·5	W. N. W.	·004	60·	61·4	57·6	W. by N.	
·063	68·8	69·	65·	W.	·018	65·8	66·8	61·	N. W.	·012	62·	62·5	,,	,,	
·075	67·8	69·2	62·	,,	·048	66·6	68·	62·5	W.	·007	61·4	62·	58·	N.	
·137	66·2	67·5	61·2	N. W.	·122	64·5	65·7	60·9	N.	·118	62·	62·8	57·4	N.	
·122	64·	65·	61·	Calm.	·101	66·2	66·8	61·8	W.	·080	60·7	62·	58·	,,	
·101	72·	72·5	66·	N. W.	·088	68·	70·	61·5	N.	·078	60·4	61·2	57·8	N. W.	
·053	65·	66·2	60·4	N.	·090	67·	68·1	61·7	,,	·042	63·	64·	60·8	N. W.	
·107	70·	70·8	62·	,,	·099	66·6	68·	61·	W.	·075	62·	63·	58·8	Calm	
·113	70·2	72·	61·	N. W.	·082	68·5	69·8	61·5	N. W.	·071	65·3	66·	62·1	N. W.	
·090	68·6	70·	63·	,,	·062	67·2	69·	62·5	,,	·060	63·	64·	60·7	,,	
·085	65·3	66·	62·	,,	·080	65·	66·	61·	,,	·074	61·	62·1	57·4	,,	·07
·157	63·	64·5	61·	W.	·127	63·	64·2	61·	N.	·129	59·2	60·4	58·2	W.	·28
·140	65·3	66·	61·8	,,	·140	64·	65·	60·8	,,	·148	59.	60·	57·1	,,	
,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
·088	68·	70·	63·	N. W.	·078	67·5	68·7	66·1	N. W.	·070	64·	65·	60·9	Calm	
·014	67·5	70·5	62·	,,	·074	65·8	67·5	60·2	,,	·086	61·2	62·	58·2	,,	
·097	67·7	68·7	61·	,,	·025	66·3	68·0	60·5	Calm	·036	61·6	62·2	57·8	W.	
·108	66·7	68·2	63·5	Calm	·013	68·9	69·5	64·5	,,	·040	60·7	61·5	57·6	Calm	
·152	67·7	68·7	64·5	,,	·115	66·	67·7	63·9	,,	·110	60·	61·	58·2	,,	
,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
·112	69·2	70·4	66·2	,,	·100	67·	68·1	65·	W.	·080	64·6	65·2	61·2	N. W.	·10
·097	68·	70·	66·7	,,	·095	68·9	69·	65·	Calm	·090	65·1	66·	59·9	Calm	·08
·101	64·8	66·5	62·	,,	·088	68·8	69·2	64·2	,,	·097	66·2	67·1	62·4	,,	1·05
·098	58·	70·	66·4	,,	·104	68·	69·	65·2	,,	·092	65·3	66·	62·1	,,	
											Total rain, inches....				1·96

NOTE A—from page 78.

Some inquiries which we have been enabled to make regarding the amount of Revenue derived by Government from the Neilgherry Hills, have led us to conclusions somewhat differing from the results stated by Captain Ouchterlony in his memoir.

According to the public accounts of the settlement of $\frac{1256\ \text{F.}}{1846\text{-}7\ \text{A. D.}}$ the assessment on lands		According to Captain Ouchterlony.		According to Collector's Account.		
cultivated by Burghers and others was	Rs.	7,820		11,623	1	4
The Abkarry Rent, - - - - - -	,,	16,300		16,300	0	0
Coopavary, - - - - - - - -	,,	300	} Moturfa	769	12	5
Shop Rent, - - - - - - -	,,	24				
Sevae Jummah or Extra Revenue, - -	,,	875		394	5	0
Stamps, - - - - - - - - -	,,	126	———	56	0	0
Post Office, - - - - - - -	,,	12,953	25,445	———		
District Post Office, - - - - -	,,	164		29,143	2	9
		38,562				

The extent of land in occupation and paying tax was as follows:

	Bull.	a.	a.				
Dry land under cultivation, - - -	3,679	13	12	yields	6,896	2	1
Pasture land at ¾ assessment, - -	1,170	12	4		425	13	3
Garden land under cultivation, - - -	50	10	12		363	9	1
——— ——— pasture, - - - -	0	12	4		1	5	6
Total	4,902	0	0		7,686	13	11
Deduct village charges, - - - - -					11	12	0
Remaining net demand, - - - - - -					7,675	1	11
Add ready money collections,							
Fixed Sournadayen, - - - - - - - - -					1,119	11	3
Quit Rent, - - - - - - - - - -					2,828	4	2
Total demand,					11,623	1	4
Of which the proportion collected within the Fusly was - -					10,378	6	6
Leaving a balance for subsequent realization of - - -					1,244	10	10

According to the Revenue accounts the lands are entered under six

different villages or parishes, some of which contain several hamlets. The former are:

Todanaad, of which the assessment is	Rs.	3,550	9	5
Kekenaad,		2,185	15	8
Boodenattam,		171	10	3
Sembanattam,		120	8	5
Segoor,		175	3	5
Paranganaad,		2,591	6	8
		8,794	13	2
Quit Rent,		2,828	4	2
		11,623	1	4

The above is the Revenue of the Coimbatore parts of the Hills only. That of the Malabar portion we have not been able to ascertain farther than as stated at p. 78, it amounted to Rupees 649-3-2 in $\frac{\text{1243 F.}}{\text{1843-4 A. D.}}$

The general revenue and statistical condition of the Hills, as exhibited in the official returns, is contained in the following tabular statement:

Statement showing

Statement showing the details of Settlements for Fusly 1256, as per Jummabundy Account, No. 2.

Group	Sub-group	Item	Value
		No. of Villages.	6
		Land Revenue of Fusly 1255, including Sournadayem.	Rs. A. P. 11,417 9 1
Villages liable to Assessment for Fusly 1256.	No. of Villages.	Cultivated.	5
		Deserted.	1
		Total.	6
	No. of Hamlets.	Cultivated.	47
		Total Villages.	53
Irrigation.		Tanks.	2
		Jungle Stream.	1
		Dam.	1
		Total.	4
Ryots.	Resident Ryots.	No. of Ryots.	1183
		No. of Puttahs.	1183
	Migratory Ryots.	No. of Ryots.	73
		No. of Puttahs.	73
		Ploughs.	986
	Non-Agriculturalpersons paying Tax.	No. of Ryots.	260
		No. of Puttahs	260
Population		No. of Houses.	3856
		Males.	8263
		Females.	6912
		Total.	15,175
Cattle.		Cows.	4545
		Bullocks.	4090
		She Buffaloes.	2297
		He Buffaloes.	835
		Sheep.	89
		Total.	11,8[illegible]

Group	Sub-group	Item	Value
Poonjah or Dry Lands in the ordinary occupation of Ryots.	Cultivated.	Extent of Land.	Bullahs as. as. 3679 13 12
		Settlement.	Rs. A. P. 6896 2 1
	Meadow or Grass Land.	Extent of Land.	Rs. 1170 12 4
		Assessment.	Rs. 1702 7 4
		Deduct ¾ Remission.	Rs. 1276 10 1
		Remainder Settlement.	Rs. 425 13 3
	Total Poonjah Land.	Extent.	Bul. 4850 10 0
		Original Assessment	Rs. 8598 9 5
		Deduct Remission.	Rs. 1276 10 1
		Net Settlement.	Rs. 7321 15 4
Garden Lands.	Cultivated.	Extent of Land.	Bul. 50 10 12
		Settlement	Rs. 363 9 1
	Meadow or Grass Land.	Extent of Land.	Bul. 0 12 4
		Assessment.	Rs. 5 6 4
		¾ Remission.	Rs. 4 0 10
		Remg. Settlement.	Rs. 1 5 6
	Total Garden Cultivation.	Extent.	Bul. 51 7 0
		Assessment.	Rs. 368 15 5
		Deduct Remission.	Rs. 4 0 10
		Net Settlement.	Rs. 364 14 7
Total Land Revenue from all Sources.	Cultivated.	Total Settlement.	Rs. 7259 11 2
	Grass Land.	Assessment.	Rs. 1707 13 8
		Deduct ¾ Remission.	Rs. 1280 10 11
		Settlement.	Rs. 427 2 9
	Total.	Assessment.	Rs. 8967 8 10
		Deduct ¾ Remission.	Rs. 1280 10 11
		Total.	Rs. 7686 13 11
		Deduct salaries of Monigars and Village Sibbendy.	Rs. 11 12 0
		Remainder of Land Revenue Settlement.	Rs. 7675 1 11
	Fixed Sournadayem	Tax on Trees.	Rs. 3 1 4
		Tax on Cattle.	Rs. 970 15 7
		Hill Rent, &c.	Rs. 65 13 1
		Jodegay or quit rent	Rs. 2828 4 2
		Paroova or pasture. Tax.	Rs. 79 13 3
		Total.	Rs. 3947 15 5
		Grand Total of Land Revenue including fixed[illegible]	Rs. 11,623 1 4

II.—*On the Fresh Water Fishes of Southern India.* By T. C. Jerdon, Esq., *Assistant Surgeon, Madras Establishment.*

Icthyology has never been a favourite study with English writers; and of all the branches of natural history it is the most neglected by amateurs and collectors. The difficulty of procuring fishes, and the uninviting appearance they present in general, is, doubtless, the chief cause of this: to which may be added the meagre history we are able to procure of their habits and manners.

We can assure the reader, however, that if once he commences the study of the finny tribe, he will find himself amply repaid by the number and variety of forms he will meet with, and the rich colouring of many; whilst the philosophic naturalist, in his attempts to arrange fishes in their natural order, will find abundant materials to work upon, and a greater individuality of form belonging to each species, than, perhaps, in any other of the vertebrated classes.

With regard to Indian fishes we have in Russell's two folio volumes but very few fresh water fishes. Cuvier and Valenciennes have, however, described many from the Carnatic and Malabar, of which I have been unable to identify several; and Hamilton Buchanan in his Fishes of the Ganges, and McLelland, in his valuable paper on the Cyprinidæ in the Asiatic Researches, have described a vast number; of which, however, we appear to possess but few in the south of India. Colonel Sykes has given a list of the fresh water fishes of the Deccan, which is very valuable, as it enumerates many new species from the tributaries of the Kistnah and Godavery—a locality which I have not had an opportunity of observing, since I turned my attention to this branch of natural history. His descriptions however are rather brief, and it is impossible to make out his species accurately, without a comparison with allied forms; and I regret much that Valenciennes has not attempted this: nor has he indeed introduced them at all into the great work on fishes of Cuvier himself. I shall notice Sykes' species in their proper place.

My own researches have been, as yet, confined to parts of the Carnatic, of Mysore, and of Malabar. I have obtained, chiefly among the carp, many species apparently new, which I shall briefly describe; and, to make the catalogue more complete, I will introduce all those described by Cuvier and Valenciennes, which I have not met with

myself; so that future inquirers can at once ascertain if a fish they meet with be a known one, or a nondescript.

Ord. Acanthopterigii.

Fam. Percidæ—Perches.

Mouth large. No scales on the fins. Operculum usually spined, and pre-opercule serrate. Teeth in the jaws, and vomer and palate; scales usually large.

Genus. *Ambassis*—Cuv.

Lower jaw long. Pre-opercule doubly crenated. Dorsal fins almost distinct: a procumbent spine before first dorsal. Caudal fin large forked.

Ambassis Commersonii. C. V.

Height rather more than a third of its total length D $7-\frac{1}{9}$, A $3-\frac{1}{9}$ greenish above, silvery beneath, with pink and yellowish reflections. Length about 6 inches. This fish though found in estuaries and the mouths of all our rivers, is hardly a genuine fresh water fish.

A. Malabaricus. C. V.

Height not a third of its length. Fin rays, D $7-\frac{1}{11}$, A$-\frac{3}{9}$, &c. 5 inches long.

I have found this ambassis in rivers of Canara and Malabar, above the influence of the tides, and in company with many true fresh water carp: so that its claim for a place in our catalogue is well founded.

It enters small streams, ditches, &c. for spawning; and I have found the young in great abundance in February, swimming in large shoals.

A. Baculis. Buch. P. G. p. 112?

Length about twice and a quarter the height. Fin rays D. $7-\frac{1}{13}$ A. $\frac{3}{13}$. Silvery, diaphanous.

I am by no means certain that this is Buchanan's fish, or Cuvier's *A. alta;* to both of which it has some resemblance. *A. baculis* is said to have D. $7-\frac{1}{13}$ and A. $\frac{3}{13}$ and *A. alta* D. $7-\frac{1}{15}$ A. $\frac{3}{14}$, and as both are from Bengal it is possible that, on comparison, my species may be distinct; in which case I suggest the name of *A. Carnaticus.*

It is found in most of the permanent tanks throughout the Carnatic, and does not exceed one and a half inch in length, in general.

Sykes' *A. Barlooi* described as having D. 7—14. A. 18, and a short vertically compressed diaphanous body, is very closely allied, apparently, both to our species and to *A. vanga* of Buchanan, which has D. $\frac{7}{12}$ A. $\frac{3}{15}$, and is very similar in shape to our presumed *A. baculis.*

Gen. *Nandus.* C. V.

Mouth protractile—five teeth in both jaws, palatines and vomer. Spine of opercule small, pre-opercule and interopercule finely serrated.

Nandus marmoratus. C. V.

Coius nandus, Buch. P. G. p. 96. *Bedula Hamiltonii*, Gray.

Height one-third of length—head the same thickness, one-third of height. Fin rays D. $\frac{13}{12}$—A. $\frac{3}{7}$—colors olive green marbled with brown. Length about 5 or 6 inches.

I have found this curious percoid fish only in tanks in the neighbourhood of Madras, and in other parts of the Carnatic. It is not mentioned as from Pondicherry in Cuvier and Valenciennes, whose specimens were all from Bengal.

New Genus. *Pristolepis.*

Char.—Body broadly oval, compressed; pre-opercule finely serrated; opercule with two flat spines; jaws nearly equal. Teeth 'en velours,' in both jaws, in vomer and palatines, and base of tongue, with a row of larger pointed teeth in front, of unequal size in the upper jaw; dorsal fin with small scales at its base; scales large, rough, very finely serrated externally (whence the generic name); lateral line interrupted; 6 branchial rays.

Pristolepis marginatus.—(New Species.)

Scales on the pre-opercule large, those on the opercule smaller. Color sapgreen, palest beneath; dorsal fin with a streak of orange on the membrane of the spinous portions of the dorsal and anal fins. Some small scales at the base of the tail. Pectoral fin rather large, somewhat rounded; soft parts of the dorsal and anal fins much higher than the spinous, and rounded; tail rounded and lateral line parallel with the back for the length of the dorsal fin nearly, and distant a quarter of the height of the body, and on the 3d scale; afterwards central and on the 7th scale. Head is to the body in the proportion of 1 to 3; and the height of the body is about half the length, *not* counting the dorsal fin. Fin rays as follows: D. $\frac{15}{12}$ A. $\frac{4}{8}$—P 15. V $\frac{1}{5}$

My specimens are only about 4 inches long, but I am told that it grows considerably larger. I was much puzzled with this fish on first procuring it, and am even now undecided if I am right in placing it in a new genus. It is allied to *Dules*, *Centrarchus*, *Pomotis*, and *Cychla*, but appears to differ from all. From *Dules* it differs in its general habit, interrupted lateral line, shape of caudal fin, &c., from *Centrarchus* in its serrated pre-opercule; from *Cychla* which is said to have an interrupted lateral line, in its spined operculum, and from *Pomotis* in wanting the prolongation of the opercule, and its interrupted lateral line—*Centrarchus*, *Pomotis* and *Cychla* however, are all American fish. Three or four species of *Dules* are described from Java, and other Eastern Islands, but none from the continent of India. I have procured specimens both from the river of Manantoddy, flowing into the Cauvery; in the Cotiaddy river in north Malabar, and in the stream that runs near Canote in the same district, where I saw it in the rapid streams.

Fam. *Sciænidæ*.

Fins partially scaled at their base; operculum armed; pre-opercule serrated; no teeth on the vomer or palate.

Gen. *Etroplus*. Cuv.

Body oval; teeth strong, notched in the middle; mouth small; anal fin long; caudal, square or lunate.

Etroplus maculatus. C. V.

D. $\frac{18}{14}$ A. $\frac{12}{10}$, of a dusky green colour with vertical dark bands—ventral and anal fins inky black; a black band at base of tail.

This fish is very common in tanks in the Carnatic, when it is called *Senel kas*, or *Nelle tanni Sipeli*, *i. e.* fresh water *Sipeli*, which is the name of the *Scatophagus argus*. It is said by the natives to be good eating, but from its small size—not exceeding 3 inches—it is not sought after. I know nothing of its habits. Its Telinga name is *Cashi-mara*. Cuvier and Valenciennes appear not to have seen this fish, which was however sent to Bloch from Tranquebar, and Schneider describes it accurately.

Etroplus coruchi. C. V.

Height half its length; muzzle concave, prominent; teeth distinctly 3 pointed. Fin rays $\frac{18}{10}$ or $\frac{20}{10}$ A. $\frac{13}{9}$. Color green above, yellowish beneath; scales of body and dorsal fin, ornamented with longitudinal rows of orange dots. Pectoral fin greenish; ventral

blackish; anal green with orange dots and margined with black; some black spots on the sides of the body. This pretty little fish is most abundant throughout the fresh waters of the western coast, being found in rivers, tanks, ditches, and pools. It is very numerous in the little streams that run through the low paddy grounds in Malabar, which abound with water lilies and many other aquatic plants. At the season of spawning the fish (both male and female I believe, though I am not quite certain of this) assumes a brighter livery than at other times; the yellow of its lower surface deepens, and the one dark spot on its side is accompanied by several others, so much so as to give it a marbled appearance, which however is somewhat transient. The eggs are not very numerous, and are deposited in the mud at the bottom of the stream, and, when hatched, both parents guard their young for many days, vigorously attacking any large fish that pass near them. I have had an opportunity of observing this, as well among fish in confinement as in the streams. When kept along with other species it is very pugnacious, attacking all indiscriminately. It is readily taken with worm on a small hook.

Fam. *Mugilidæ*—Mullets.

Though none of the mullets can be called fresh water fish, yet some of them ascend rivers to a considerable height, and after the monsoon are often to be found in the streams that intersect the paddy fields when communicating with a river, and even in the inundated paddy fields, where, as the waters evaporate and the bunds are closed, hundreds, chiefly of small size, are caught every year.

Fam. Spirobranchidæ. Swainson.

Pharyngiens Labyrinthiformes of Cuvier.

Belly very short; vent, near the pectoral part of the upper pharyngeals, laminated and capable of retaining water. Dorsal fin single, long.

This is a very peculiar order of fishes and very characteristic of India; several of the species being widely spread over the whole peninsula; and the most marked genus of the family, (viz.: Ophicephalus) abounds in nearly allied species, as is usually the case in all genera that are peculiarly characteristic of any country. From the conformation of these fishes they are enabled to live long out of water, and some of them bury themselves in the mud, when the waters of the tanks or ditches are dried up; and are enabled to live for some time

in a torpid state, till a fresh supply of water calls them into renewed existence.

Gen. *Anabas.* Cuvier.

Exterior edge of operculum strongly serrated; and armed with spines; pre-opercule smooth; spines of the dorsal and anal numerous; scales on head and body strong. Teeth minute, with a few larger in front, especially beneath, and some in front of vomer, on the vomer, and on the pharyngeals, but none on the palatines; lateral line interrupted, a few small scales on base of the dorsal, caudal, and anal fins.

Anabas scandens. (Dald.)

Anthias testudineus, Bloch; *Amphiprion scansor*, Schneider; *Coius cobojius*, Ham. Buch.; *Goraka*, Teloogoo; *Panni-eyri*, Tamul.

Very variable in color, usually greenish, marbled or speckled with darker, occasionally quite black, fins reddish usually, and in the young spotted. D. $\frac{16}{9}$ A. $\frac{10}{10}$

This species, the only one of its genus, is found not only all over India proper, but in Burmah, Malacca, Java, Celebes, and other eastern isles. It has attained some celebrity from the fact of its being occasionally found on palm trees growing close to the water's edge. Lieutenant Daldorf mentions that he himself took one from a cleft in the bark of a palmira palm, five feet above the tank. The natives of the Carnatic invariably assert that it is a common occurrence to find them in such situations, and I think there is no reason to doubt that it often takes place. I may here remark that the Tamil name, *Panneieri*, means climber of palmira trees, not of trees in general. I have kept small ones in a vase of water. They, in general, are very sluggish, but every now and then rose slowly to near the surface of the water, then made a dash to the top, and down to the bottom again with all speed. Some individuals (young ones) had the tail and soft part of the dorsal fin much lengthened, thus approximating some of the species of Macropodus, but the prolongation does not appear to be persistent. This fish abounds in all the ditches, pools, and tanks throughout Southern India, but is not in general found in the rivers. I have not seen it longer than 6 inches, usually less.

Gen. *Colisa.* Cuvier.

Dorsal and anal fins long; base covered with scales; ventral consisting of a long ray reaching to the end of the tail which is rounded.

Colisa fasciata. (Bloch.)

D. $\frac{4}{9}$ A. $\frac{16}{13}$. Eight or ten vertical dark bands on sides of body. Hab. Tranquebar. I know nothing of this or the next species, but as several of the genus are stated to inhabit fresh waters, I have included them in this list.

Colisa Ponticeriana. Cuvier.

Opercule rounded with a black spot near its lower edge ; oblique brown lines on its body. D. $\frac{16}{12}$ A. $\frac{16}{17}$. Hab. Pondicherry.

Gen. *Ophicephalus.* Cuvier.

Body lengthened, somewhat cylindrical; head broad, depressed, covered with bony plates; muzzle short, obtuse; dorsal fin long; it and the anal destitute of spiny rays.

Ophicephalus punctatus. Bloch.

O. Karouvei, Lacep. *O. lata*, Ham. Buch.

Body compressed behind the pectorals; muzzle semi-circular; eyes near the end of the muzzle. D. 31, A. 20, V. $\frac{1}{5}$. Color dusky green above, whitish beneath, with obscure markings on the back, dorsal, anal, and caudal fins. I have not seen any spotted in the marked manner described by authors. The rays of the dorsal fin are sometimes 30, and those of the anal 21, 22, and 23.

This fish which is the *korave* of the Tamuls, and the *muttah* of the Telingas, is exceedingly common in all the sluggish rivers of India, and also in almost every tank, ditch, and well. It is not usually met with longer than 6 or 8 inches, but is said to reach a foot and more. It is very easily taken with a hook baited with worm, and is said to be good eating.

Ophicephalus marginatus. Cuvier.

Head shorter, broader, and more round than the last; ventrals very small, of an uniform dusky green color, lighter beneath ; dorsal and caudal fins margined with orange; the former, and pectoral, with a tinge of the same color throughout. D. 34, A. 22.

I have found this species most abundant in Mysore, both in rivers and tanks, but it is also found in the Carnatic. I have not seen it longer than 6 inches. The natives apply the same name to it as to the last, which indeed it very closely resembles.

Ophicephalus fuscus. Cuv. and Valem.

Head and cheeks more swollen out than the last. D. 35 or 36. A. 22. From Bengal and Mysore, 6 inches long. I have not seen this species myself, to my knowledge at least, for I may have very easily passed it over.

Ophicephalus striatus. Bloch.

O. Chena and *C. Sola.* Ham. Buch.

Head depressed rounded in front, D. 40 to 45, A. 26—27. Colors, dusky green above, white beneath, with bars of the former color extending into the white of the lower parts. Belly often spotted; fins sometimes uniform in tint, at other times barred and spotted.

This fish is the *Kora* of the Telingas, and the *Varalu* of the Tamuls. It abounds in all large rivers and tanks, and is highly esteemed both by Natives and Europeans, and as it is the only good fish to be procured at many inland stations is much sought after. It attains a large size. I have seen it nearly 3 feet long. It is very voracious, and is easily taken with a frog or small fish as a bait.

Ophicephalus marulius. Buch.

Head more compressed than in the others of this genus. D. 52 to 56, A. 31 to 35. Colors greenish above, white beneath. Dorsal and anal fins fine green, dotted with white spots; body sometimes similarly white spotted. Attains the length of 3 feet and more. I have seen this very fine fish only in large rivers. It is most excellent eating. I think that Sykes' O. *leucopunctatus*, described as having 51 to 53 rays in the dorsal fin, must be identical with this species, which is said by Buchanan to be found in every part of India.

I may here state that *Polyacanthus cupanus.* C. V. another fish belonging to this family—is only found, that I am aware of, in backwaters and rivers within the influence of the tides. It must be handled with caution, for the spines of its fins inflict a most severe burning pain which lasts for two or three hours.

FAM. SCOMBERIDÆ—?

Sub. Fam. *Notacanthinæ.* Swainson.

Body anguilliform, compressed; dorsal and anal long, and close to the caudal; a series of detached spines in front of the dorsal fin; snout lengthened.

Gen. *Rhynchobdella.*

Snout very projecting, fleshy, bent downwards, three cleft; caudal fin distinct.

Rhynchobdella aculeata. Bloch.

R. Ocellata. C. V.

Brown above and on the sides, yellowish beneath, fins with a sienna tinge, and the dorsal with three black spots or eyes; caudal barred, fin rays D. 18—52, A. 3—52. Length about 9 or 10 inches.

This species, the only one of its genus, is common enough in the rivers and tanks of the Carnatic; but I have seen it no where else. It is called *Aral* by the Tamuls, and *Bomri* by the Telingas. The number of spots on the dorsal fin varies. It is said to be good eating.

Gen. *Mastacemblus.*

Snout projecting; some small spines on the pre-opercule; dorsal, anal, and caudal fins united.

Mastacemblus ponticerianus. C. V.

A row of 18 spots along the back, and 12 along the edge of the anal fin. D. 78, A. 72.

I have not seen this fish which appears very similar to the Bengal *M. armatus.*

Mastacemblus marmoratus. C. V.

Green above, yellowish beneath, tinged with sienna under throat; spots on the back, and marbling on the sides dusky brownish; depth of body to the length as 1 to 12 or 13. D. 37 to 39, 84 to 87, A. 3—90 to 92.

I have procured this fish from the tanks about Bangalore, and in rivers that flow into the Cauvery. It grows to the length of 2 feet and upwards. It is the *Konda Bomri* of the Telingas.

Mastacemblus Malabaricus. (New Species.)

Body less thick in proportion to its length than the last; colors very similar, but the marbling more distinct, and extending lower down the sides. D. 37—74? A. 3—74.

I have found this species, which is very closely allied to the last,

in streams and rivers in Malabar. It grows to the length of 18 inches and upwards, and is considered good eating.

Col. Sykes has in his list a *Mastacemblus armatus* of which he says: " Fins of the tail, back, and vent united, with 39 to 40 short sharp bony spines along the back and two behind the vent. This fish has not the exact generic characters of Macrognathus, Mastacemblus, or Notacanthus, and might probably constitute a genus between the two last."

Fam. GOBIDÆ.

Head large; ventral fins generally united; anterior dorsal rays slender, flexible.

Gen. *Gobius*.

Caudal fin rounded or lanceolate; dorsal fins two; lower jaw longest.

Gobius kokius. C. V.

Head about a quarter of the total length, broad; muzzle obtuse; eyes approximated; profile of head almost on a line with that of back; D. 6—$\frac{1}{9}$, A. $\frac{1}{8}$ of a dusky greenish fulvous tinge, with large wavy spots on the back and sides; caudal and second dorsal spotted, reaches 8 or 9 inches in length.

Very common in tanks, rivers, and ditches throughout the south of India. It is a sluggish fish keeping to the bottom; and very voracious. When it moves it does so close to the ground, generally raising a cloud of mud about it, which conceals its situation. It is called *Baligedda* by the Southern Telingas, and *Koka* in the north, according to Russell.

Gobius neglectus. (New Species.)

Bullee korah, Russell pl. 53? but not *G. Russelii*, C. V.

Profile of head sloping from the eye to muzzle. Head a quarter of total length; not so broad as in the last one; eye one-fifth of length of head, and distant barely one diameter from each other; scales small, about 50 along the body. D. $\frac{6}{11}$, A. 10 or 11.

Until I had actually compared my fish with the ample description in Cuvier, I had no doubt of my fish being the *G. Russelii*, to which he refers Russell's figure; but there are too many points of difference to allow of this. In *G. Russelii* 'the eyes small and distant, their diameter is one-eighth the length of the head, and they are dis-

tant two diameters from each other. D. 6—$\frac{1}{8}$, &c. &c.' The colors of our fish are nearly uniform fulvous, with occasionally some dark markings on the back; and the second dorsal and caudal fins spotted. I procured it from the vicinity of Madras, where however it is rare, and also from streams in Malabar, where it is by no means uncommon near the mountains, and there completely replaces *G. kokius* of the lower parts of the district. I have seen it nearly 8 inches long. Colonel Sykes has a *Gobius kurpah* of which he says, "7 rays in first dorsal, 11 in the second, which is of similar size with the anal fin, 19 in the pectoral, and 10 in the anal fin." It is impossible from these few details to decide whether this be a distinct species, or to be referred to some of those described.

Gen. *Eleotris.*

Ventral fins not united; eyes remote; six branchial rays.

Eleotris nigra. Q. and G.

Scales small, 65 along the body, and 22 or 23 in its depth; body, broad in front, and compressed behind; its depth one-fifth of its total length. D. 6—9. A. 1—8. Color very variable, usually yellowish above, dark on the sides and beneath, each scale marked with black; fins yellowish, the rays finely barred; cheeks and opercula dark with pale markings; 3 to 4 inches long.

I have not seen this Gobioid fish in the Carnatic. It is very common in Malabar in ditches and tanks, concealing itself under stones, and among weeds; and remaining for hours motionless. Its movements are very slow, and it is very fond of fixing itself vertically to the side of a tub or vase (in which it may be confined) with its head downwards. It has the faculty of changing its colors, at times becoming nearly black, at other times marbled; and usually with a strong line of demarcation between the tint of the back and sides. Its nostrils are tubular and exserted. It appears widely spread, being found in the Ganges, at Bombay, Java, Waigion, Society Isles, Madagascar, and the Mauritius, at which place it is named *l'endormi* and *Cabot noir.*

III. *Notice of the Scientific labors of the late* Dr. Alexander Turnbull Christie, *with extracts from his Official Reports submitted to Government.*

Among the papers transmitted by order of Government to the Literary Society, for examination and publication in the Journal of Literature and Science, is a correspondence extending from 1829 to 1834, connected with the appointment of the late Dr. Turnbull Christie, to investigate the natural resources and productions of this Presidency.

Unhappily for the cause of science Dr. Christie did not live to carry out the designs which induced him to solicit the employment above mentioned. A brief interval of little more than six months only intervened between his return to India and an attack of remittent fever, which rapidly hurried him to the grave. The papers under consideration, therefore, have not been found to contain much new or valuable matter; but we gladly embrace the opportunity, which such an occasion affords us, of commemorating, in the pages of this Journal, the name of one whose scientific knowledge and acquirements were only equalled by his modesty and worth in private life, and whose indefatigable zeal in the pursuit of knowledge would, had his life been spared, have ensured him a more lasting place in the records of science.

Alexander Turnbull entered the medical service of the East India Company in September, 1822, and was first appointed to do duty, as a probationer, with the Horse Artillery, St. Thomas' Mount. In 1823 he proceeded in medical charge of a detachment of young Officers from Wallajabad to Gooty; and subsequently in charge of details of Artillery to Secunderabad and Jaulnah, where he joined the C Troop of Horse Artillery commanded by Captain Black. In the same year he was present with that Troop at the disastrous affair under the walls of Kittoor, in which all the other officers being killed or disabled, the charge of conducting the remains of the detachment to Dharwar, devolved upon him. His conduct on this occasion met with the approbation of his superiors, and a vacancy occurring at the time, in the situation of medical officer to the Political Agency in the Southern Mahratta country, he was nominated to succeed Dr. G. Hamilton Bell, at his own request, supported by the earnest solicitation of all the residents at the station.

Here he remained until December, 1827, when a severe attack of illness compelled him to return to his native land for the recovery of

his health, having shortly before succeeded to the small landed property of Grueldykes in Berwickshire; in consequence of which he adopted, in addition to his own, the maternal surname of Christie. An opportunity was now afforded him for the renewal of his scientific studies, of which he eagerly availed himself, prompted not only by his taste for such pursuits, but by his anxiety to carry out a favorite and long cherished project for systematically and thoroughly investigating the natural history of India. During his intervals of leisure he contributed various papers, the results of his previous observations, to the Edinburgh Philosophical Journal, conducted by his old master Professor Jameson. The chief of these was a valuable topographical description of the Dharwar province, and neighbouring districts, entitled "Sketches of the meteorology, geology, agriculture, botany, and zoology of the southern Mahratta country;"* in the course of which he gave one of the earliest, if not the very first description of the cataract near Garsuppa in Canara, with notices of the ruins of Bijanagar and other places of interest.

The chief value of this paper consists in the minute and interesting observations it contains on the geognostic relations of the tract between Hyderabad and the Malabar Coast, and the Dooab of the Kistna and Tongabadra.

Meantime, his application to the Court of Directors, for permission to devote himself more exclusively to his favorite pursuits, had been attended with success. In a despatch of the 2d June, 1830, they transmitted to Madras the testimonials which he had submitted of his qualifications, and authorized the Government of Fort St. George to relieve him from his duties as a medical officer, for the space of two years, to enable him to prosecute his researches in geology and mineralogy, during which he was to receive the ordinary pay and allowances of a medical officer, without a specific professional charge. These testimonials which are given below† were of the most flattering

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* Edin. Phil. Journal, Vols. for 1828, p. 292—1828-29, p. 98—1829, p. 49, re-published in this Journal, Vol. IV. pp. 185 and 452.

† Geological Society, Somerset House, 6*th April*, 1830.

My dear Sir,

You are probably well aware of the very imperfect state of our knowledge respecting the Geological structure of the Peninsula of Hindostan, and you will therefore, we feel certain, lend your assistance in the furtherance of any effort to acquire the requisite information thereon. A friend of ours, and a fellow of our Society, Dr. James Turnbull

character, and bear the signatures of Sedgwick and Murchison, of Brongniart, of Brochant de Villiers, and of Jameson.

Mr. Turnbull Christie left England, on his return to India, about the beginning of 1831, travelling through France and Italy, thence embarking for Alexandria. He remained some time in Egypt, and after visiting Syria and Mount Sinai proceeded down the Red Sea to Bombay, which place he reached in April, 1832. Before leaving England he had provided himself with a complete set of instruments for ascertaining the nature of the meteorological and hydrographical phenomena that might present themselves to his attention, and was accompanied by a painter to depict objects of zoology, comparative anatomy, botany, &c. &c.

Christie, a Medical Officer in the service of the Honorable East India Company, who is about to return to the East, is extremely desirous of obtaining the permission of the Court of Directors, to employ himself exclusively in elucidating the geology of the Company's possessions; and we have no hesitation in stating that he is well qualified to enter upon such a task. Since his arrival in Europe he has travelled through France and Italy, where he has worked with various eminent Geologists—Von Buch, de Beaumont, &c.—and he is now sedulously occupying his time in acquiring an intimate acquaintance with the English strata ; it being his intention, during the ensuing summer, to revisit all our coal mines, and to examine in detail the coast sections from the Isle of Wight to Cornwall.

It would be superfluous on our part to point out the manifold advantages which might accrue to the Company, from the employment of such a man of science in the unexplored field of Hindostan : the mineral riches of which (especially certain great *coal* basins) still remain to be developed.

We cannot but hope that a Government which fosters and encourages, with so much liberality, the sciences of Botany and Zoology, will equally aid the Geologist in his endeavours to unveil the *numerical** structure of the vast empire which it rules over.

Requesting you therefore to state the case to your brother the Chairman, we subscribe ourselves.

Your's very sincerely,

(Signed) A. SEDGWICK, *President.*
R. MURCHISON, *Secretary.*

COLLEGE MUSEUM, EDINBURGH, *April 6th*, 1830.

This certifies that Dr. Alexander Turnbull Christie, before leaving Europe for India in 1822, studied in this University the following branches of Natural History, viz., Geology, Mineralogy, Meteorology, Hydrography, Botany and Zoology. That, during his residence in India, he continued to cultivate Natural History with great zeal, and much success. That since his return to Britain, with the view of enabling him to carry on his investigations in India, on his return to that country, in

*Sic orig.

From Palermo, in a letter to Professor Jameson, dated 31st May,* he communicated a notice of some curious caves in the neighbourhood of that city, containing diluvial remains of the large extinct mammalia, which, unlike those of Kirkdale described by Professor Buckland, occurred as constituents of a breccia, in some cases *superimposed* on more recent quaternary formations, containing shells identical with those now existing in the Mediterranean. A more extended description of the same phenomena, transmitted to Sir R. J. Murchison, President of the Geological Society, was read before that body on the 2d November, and appeared in the Edinburgh Philosophical Journal for 1831-32.

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the most efficient manner, he has, during his residence in Edinburgh, continued his studies in Geology with unabated zeal; and that, lately, he has spent a year in France, and other countries on the continent of Europe, in enlarging his acquaintance with Geology and other branches of Natural History.

We have therefore much pleasure in certifying that, in our opinion, Dr. Alexander Turnbull Christie is eminently qualified to undertake and execute, not only the important duties of a geological surveyor, but also, from his intimate acquaintance with Meteorology, Botany, and Zoology, of adding to the interest and value of his Geological reports, by scientific and practical observations and views in regard to the climate, and the characters and uses of the vegetable and animal productions of the various countries he may examine or pass through.

(Signed) ROBERT JAMESON,
Regius Professor of Natural History, and Lecturer on Mineralogy, &c.

The undersigned, Member of the Paris Academy of Sciences, Professor of Mineralogy at the Royal Museum of Natural History, &c., most willingly gives testimony of the assiduity and application, with which Mr. Christie attended his courses of Mineralogy at the Museum; and it gives him pleasure to state the frequent, long, and a long time continued visits made to him by Mr. Christie at his private geological cabinet, for the purposes of studying there the specimens of rocks, earths, and fossil organic bodies it contains; and he has no doubt that the fruit to Mr. Christie, from this study and application, has been the acquirement of knowledge suitable for the success of the pursuits and labors he may undertake, and for which this kind of knowledge is necessary.

PARIS, 1*st March*, 1830. (Signed) ALEX. BRONGNIART.

I hereby certify that Mr. Christie of Edinburgh attended assiduously, and with advantage, my course of Mineralogy at the Paris Royal School of Mines, in the autumn and winter of the year 1829.

(Signed) BROCHANT DE VILLIERS,
Member of the Royal Academy of Sciences, &c. &c.

PARIS, 5*th March*, 1830.

* Edin. Phil. Journal, 1831, p. 282.

From Bombay Dr. Christie proceeded down the coast by sea to Mangalore, and thence by way of Cannanore, Tellicherry, and Wynaad to the Neilgherries, whence, after a month's stay, he went to Madras. A sketch of his observations on this journey, contained in a letter to Professor Jameson, appeared in the Edinburgh Philosophical Journal for 1833, (p. 153,) and a more detailed official report, dated 5th September, 1832, submitted to Government, was considered worthy of transmission to the Court of Directors.

The following extracts are taken from this paper, which embraced observations on the geological structure of the country from Mangalore viâ Cannanore, Tellicherry, and through Wynaad to the Neilgherry Hills.

"The country on the coast, and probably extending to the foot of the Ghauts, consists entirely of the ferruginous claystone formation, which has been described by Buchanan under the name of laterite. It rests upon granite and gneiss, which make their appearance in the beds of many of the rivers, and very frequently on the sea coast. The laterite is of little importance in an economical point of view, except as a building stone; but is interesting when studied in relation to the phenomena of springs, the nature of soils, and its general effects upon vegetation. As far as I had an opportunity of examining the other formations, they appear to yield no mineral products of any value.

"A few miles to the north of Mangalore, and in connection with the laterite, I discovered an extensive deposit of pure porcelain clay, very closely resembling that of Limoges in France, of which the beautiful Sevres ware is formed. I need not point out the importance of this article. Being found close upon the coast, it might be easily shipped, and sent home as dead weight; or, with the assistance of Chinese workmen, it may hereafter become an article of manufacture in India. I also found it in considerable abundance, and of nearly equal purity, on the Neilgherries.

"The whole of Wynaad consists of primitive rocks, with a few patches of laterite, in certain situations, and great deposits of diluvium. In the latter (which consists principally of a reddish clay, with imbedded fragments of gneiss, granite, and quartz) gold is found. On the road between Nelliaal and Goodaloor, I observed some shallow pits in the diluvium, and remarking the similarity between this deposit, and those in which gold is found in other parts of the world, I made inquiries of the natives respecting it, and ascertained that they procured gold here by washing it in the rainy season. Having seen no geological account of the gold works in this part of India, I am not aware whether the metal has yet been found in its original matrix, or whether it is wholly derived from this loose transported deposit, or diluvium as geologists call it. The latter

forms a succession of low rounded hills, which are intersected by streams, and are every year partially worn down by the rains, which is perhaps the origin of the river gold of these districts.

"The Neilgherry hills are entirely composed of primitive rocks, consisting principally of granite, gneiss, a large quantity of earthy felspar, quartz, and a peculiar rock, which I would name Corundum rock, from its having that mineral as one of its principal ingredients. I have met with nothing analogous to it in Europe, and it occurs in great abundance; many of the hills being entirely composed of it.

" Some interesting questions connected with the parallelism and elevation of strata, and other branches of theoretical geology may derive elucidation from a more minute survey of the Neilgherries and the neighbouring country.

"The climate and agricultural features of the Neilgherries are more interesting, and more worthy of attention than their geology. These hills rising in the middle of the torrid zone to the height of nearly 9,000 feet, present every variety of climate, from that of the plains of India to that of England. The climate of their higher parts resemble the great intropical cities of South America,* which have become the centres of civilization in the new world, but is superior in one point of view, being never subject to those sudden changes and cold piercing winds which are occasioned by the vicinity of lofty mountains, some of which are capped with snow. The mean temperature of Ootacamund is rather more than that of London, but its annual range of temperature is very small, and it may be said that the season of spring reigns throughout the year. Yet though there is no winter the heat is never sufficiently great to bring the more delicate Europe fruits to perfection, and at this height we can only expect the successful cultivation of corn and vegetables. The valleys which have the height of from five to six thousand feet enjoy the climate of Italy—the climate of the vine, the olive, the orange, and the mulberry. The tea tree is cultivated in China between the latitudes of 27° and 31°, in a hilly country, and consequently in a climate probably of 70° to 73° of mean temperature. Such is nearly the temperature of the valleys in the neighbourhood of Kotagherry, and of many others along the eastern and northern faces of the hills. The cultivation of this valuable plant might therefore be attempted here, and with a much better chance of success, than in almost any country beyond the limits of China. A little lower down than this coffee might be produced ; its native habitation being on the sides of the lofty mountains of Yeman, and nearly in the same latitude as the Neilgherries.

* Quito is about 9,000 feet above the level of the sea, Santa Fé de Bogota 8,000 feet, Mexico about 7,400, and Caraccas nearly 3,000 feet. Although the latter place has been called an earthly paradise, its climate is changeable and unhealthy.

"But with all these advantages of climate, there are certain peculiarities, which, in some situations, prove most injurious to vegetation, and if overlooked in any schemes for the improvement of agriculture or horticulture in these regions, might mar our best exertions. These are 1st. The great intensity of the solar rays, when the sky is not obscured by clouds. 2dly. The great waste of heat from the ground, and from plants, by radiation in clear nights. The former will sometimes produce a heat of from 90° to 100° on the surface of leaves, flowers, and fruit during the day; the latter may subject them, in the succeeding night, to a degree of cold considerably below the freezing point. Few plants will bear so great a transition, and it is only to be avoided by a judicious selection of situations, which are not likely to be much under the influence of the two causes I have noticed; or, in the case of fruit trees and garden plants, by matting, and other contrivances. I need scarcely remark that it would be highly desirable to ascertain the meteorological characters of the different parts of the hills, before attempting the introduction of any new staples; otherwise, in a new country and without experience, success would be very questionable, and would rest only upon blind chance.

"Next to the climate of a country the most important object an agriculturist has to turn his attention to is the nature of the soils. One of the most remarkable features of the Neilgherries is the great depth of soil met with even on the highest hills. It has originated principally from the disintegration of the earthy felspar mentioned above, which is more or less mixed with sand, is coloured with iron, and, in some situations, contains numerous pebbles and small fragments of quartz, and of the other subjacent rocks. In some valleys it contains a certain quantity of vegetable matter; and in many places on the higher hills a thick coat of black vegetable stuff is found, principally formed of decayed ferns, and which might, perhaps, be usefully employed for the amelioration of other soils. The ground is, in general, easily worked, but being (as far as I can at present judge) entirely deficient of lime and of every description of salt, it will probably for certain kinds of cultivation, require to be highly manured, either with lime, with salts, or with vegetable and animal composts. Lime is clearly indicated as a manure for the Neilgherry soils; but the very circumstance which renders it so necessary, viz., its total absence amongst the subjacent rocks, makes it difficult to be procured. The lime which is employed in building is obtained from the kunker (calcareous tufa) which occurs in great abundance all over the plains of Coimbatore. Upon analyzing it, however, I have found it to contain a considerable quantity of magnesia, which renders it totally unfit for the purposes of agriculture, nothing being so injurious to vegetation as that earth. Were the distance not too great, shells might be brought from the coast to improve the soil, and sea salt and nitre, neither of which are very expensive, might prove useful.

"I need not insist upon the inducements, that these and some of the other

hills further south* hold out to English enterprize; since the Government have already by their many liberal and enlightened measures for their improvement, shown themselves perfectly confident of the immense advantages that must hereafter be derived from them.

"After having remained several weeks on the Neilgherries, I came to Madras by way of Trichinopoly and the coast, in expectation of finding some secondary formations near the former place. In this, however, I was disappointed, and found that part of the country to possess but little of geological interest. On the coast I was more fortunate, having discovered several curious deposits containing fossils, which are calculated to throw some light on the geological epochs of the Indian formations."

In addition to the matter set forth in the foregoing extract, Dr. Christie made considerable collections in zoology; including some interesting specimens of fresh water fish, crustacea and insects. Four cases of these, containing several hundred birds, a few mammalia, a small collection of fresh water fish from the rivers of Malabar and Wynaad, and some crustacea and reptiles, were forwarded to the Court of Directors by the Madras Government in October, 1832; as also a specimen of the porcelain clay above mentioned. Dr. Christie further projected an extensive series of meteorological observations to be made at the principal stations throughout this Presidency, in concert with similar observations to be carried on simultaneously in Bombay, Bengal, and Egypt. At his recommendation the Government of Fort St. George wrote home for 25 sets of meteorological instruments, and a code† of directions for conducting the observations, was drawn up by him, which was adopted and printed both by the Governments of Madras and Bombay.

It was the expressed wish of Dr. C. that he might be permitted to devote part of his time to a more minute survey of the Neilgherry Hills, so as to enable him to exhibit an accurate exposition of every thing connected with their physical geography; such as the height of their principal summits; the general height, form, and direction of their valleys; the climate of their different parts; the character and composition of their soils; the nature of their springs and streams, their vegetation and geology.

He also made preparations for the establishment of a small experimental farm, with a view to the improvement of coffee, tea, the

* The Pylney and Vurragherry Mountains which have probably an elevation of from 5,000 to 7,000 feet above the sea.

† Reprinted in Vol. 2, page 41, of this Journal.

mulberry, and other valuable products, at his own expense, a project which met with the warm approval of the Government. He, at the same time, pointed out the inadequacy of the allowances, scarcely exceeding 200 Rupees per mensem, allotted to him under the instructions of the Court of Directors. The justice of his representation was fully admitted by the Right Honorable S. R. Lushington, and he was permitted to draw an extra allowance of 500 Rupees per mensem, in addition to the regimental pay and allowances of his rank, already sanctioned by the Court; subject however to a refund of the excess, in the event of the measure not meeting with the approval of the Honorable Court, which eventually it did not.

These matters apparently so favorably arranged, Dr. Christie set out on his return to the Hills; proposing, in the first place, to commence operations there, and, in the ensuing cold season, to prosecute his geological researches as far south as Cape Comorin. He was not permitted however to realize any portion of his plans. On the 28th October, soon after his arrival at Ootacamund, an attack of jungle fever, contracted in passing through the Goodaloor jungle at the base of the Neilgherries, showed itself in a complete prostration of the whole nervous system; a symptom on which no remedy seemed to have the slightest influence; and he sunk on the 3d November, after seven days illness, at the early age of 32.

Little remains to be added to this sketch of one, the sudden close of whose career cut short a course of projected labors, ere an opportunity had been afforded of estimating the full value of the qualifications brought to bear upon them. To his friends he was endeared by many of those amiable qualities which are best appreciated in private life. To a kind and obliging disposition he added a singularly modest and unassuming deportment, and a mild and gentle address. His talents appeared to be rather solid than brilliant. Their application was characterized by patience, method, and perseverance; qualities of peculiar value in a field where neither collateral aid, nor facilities of research, were available. The value of these natural qualifications was enhanced by the nature and extent of his acquired advantages. In the words of Professor Jameson, "Dr. Christie's enthusiasm in the cause of science was of the purest and most enthusiastic nature; and his acquirements in natural history were never surpassed by any British Naturalist who visited India. He was master of the practical and theoretical details and views of meteorology, hydrology, geology, mineralogy, and zoology; and, in botany,

had all that practical skill required in collecting the species, and tracing them, with a view of their physical and geographical uses in the vast countries which, it was hoped, would have been explored by him."

"Mere collectors of objects of natural history," it was added, "will no longer satisfy either the E. I. Company, or the demands of science. Plants may be collected by a well instructed gardener, and rock specimens by a skilful lapidary. The naturalists sent to India ought to be of a different stamp. They should be armed at all points with the powers of general science; with a thorough knowledge of those instruments employed in investigating the phenomena of the atmosphere, and of the waters of the globe, and the physical constitution of the earth; an extensive and accurate *practical* acquaintance with the present state of the most important of the natural sciences, both in a general and economical view, viz., geology and mineralogy. And it will be very desirable, and indeed indispensable, that those entrusted with the natural history surveys in India, should be able to collect with judgment, and investigate with accuracy the facts presented by the animal and vegetable kingdoms."

These observations were penned in the expectation of a worthy successor being immediately selected to supply Dr. Christie's place. That hope has never been realized. It was to his voluntary and unaided enthusiasm alone, that the idea of any researches of the kind owed its origin. With his death the project expired. The value of such investigations is unhappily not recognized by British statesmen; and although India has exhibited repeated instances, among her adopted sons, of the rare and valuable qualifications which such pursuits demand, she has not yet reaped an adequate return from their employment in the direction best adapted for the public good. Of late a more enlightened spirit seems to have actuated the public men of England, and the illustrated scientific publications of the results obtained during the voyages of the *Sulphur*, the *Blossom*, and the *Samarang*, do credit to the liberality of the statesmen, under whose auspices they have appeared. Let us hope that similar enlarged views may, at no distant period, be extended to India.

M.

IV.—*On the Thermal Springs of Calwa and Mahanandi in the Kurnool province. By Captain* Newbold, *F. R. S., For. Mem. of the Philomathique and Geological Societies of France, &c.*

Springs at Calwa.

Lat. N. 15° 38′ and Long. E. 78° 16.′

These fine springs are situated about 1½ miles southerly from Calwa, a large and old village in the heart of the Kurnool district, Lat. N. 15° 38′ Long. E. 78° 16′ at the approximate height, by boiling point of water, of 1,100 feet above the sea. The village of Calwa lies at the S. E. extremity of an extensive horse-shoe shaped *cul-de-sac* formed by two hilly spurs stretching out from the main chain of the district towards the N. E. and E. N. E. The features of the country extending between the sides of this *cul-de-sac* are those of a plain intersected by rivulets about 5 miles broad at Calwa, but upwards of 11 where it opens upon the plain. The inclination is to the N. E. as indicated by the course of the rivulets, the principal of which take their rise in the hills forming the chief bend of the horse-shoe ;—and after traversing its whole length, about 15 miles, and passing the end of the S. E. range they take a sudden turn to the southward, unite and form the Khúnd river ; which, after watering the plains of Nundiaul Dhúr, falls into the Pennar near Camlapúr. The principal supply of the larger of the rivulets is derived from the thermal springs which have their origin near the head of a picturesque glen in the hills close behind and south of Calwa.

The first spring is about a mile from the village and is received into a stone tank ; its temperature is 89° 3. Fahrenheit. That of the second, which is choked with weeds, is also retained by a stone tank about 5 paces square and lies about ¼ of a mile farther up the glen : its temperature is 89°. That of the 3d and last, ¼ of a mile farther, and nearer the head of the glen, is 90°, temperature of air in shade 78°. This last from its greater copiousness, and higher temperature, is held more sacred than the rest by the Hindús, who have built near the margin a temple dedicated to *Iswara*, with the prefix of Bhúga, in compliment to the spring or bhuga. An annual játra takes place to the temple and spring. The latter gushes out from the rock on the side of the glen from several fissures, into a handsome stone tank about 9 spaces square. The water is beautifully transparent, taste-

less, odourless, and about four feet in depth. It abounds with fish held sacred by the brahmins. The surplus water of these thermal springs falls into a rivulet, which, taking its rise about 4 koss farther among the hills at Pendacull Yejarú, runs along the bottom of the glen from the higher part of which a *calwa* or aqueduct conveys the water to the lands around the village, whence its name. The temperature of this rivulet above the thermal springs is 82°, temperature of air in shade 78°.

Around the orifices through which the 1st and 2d springs escape are thick beds of calcareous tufa, deposited probably by the water of the springs. The surrounding formation is the blue limestone, associated with the diamond sandstone, which caps the former at no great distance from the springs, and in which I counted more than 40 old diamond pits. The glen itself, from the examination of its sides, appears to have originated in a fault in the limestone, which affords a vent to the subterranean waters which are perennial.

The Bhúga of Mahanandi.

Lat. N. 14° 56′ and Long. E. 78° 16.′

These large, thermal, and perennial springs gush from the western base of the Nulla Mulla Hills which separate the Kurnúl territory from that of Cuddapah. The brahmins, ever vigilant to convert any extraordinary phenomenon of nature to their own ambitious policy of swaying the minds of the ignorant and superstitious mass, have for ages past appropriated this sequestered spot in the recesses of a jungle infested by tigers, and enclosed the springs within the walls of a massive stone temple consecrated to the great bull Mahanandi, and to the phallitic emblem of creative power the lingum.

The nearest village is that of Gázúpilly which lies about two koss in a southerly direction. Hence the road to the springs is a mere foot path through a succession of woodland belts increasing in density as the hills are approached.

The temple enclosing the springs stands in a dense jungle at the base of an outlier of the range also thickly wooded. Within its outer wall is a spacious quadrangle, in the centre of which, and immediately in front of the Vimána and principal shrine, lies a nearly square tank of lustration—revetted with stone, and having a small open temple (Mandop) in the centre, covering several small phalli placed on its stone base.

The tank is nearly square, 23 paces long by 22 broad. The depth varies from about 3 to 5 feet. It is filled by the thermal springs chiefly from the eastern side bubbling up from at least seventeen orifices. The principal jet has been contrived to leap forth from the mouth of a cow rudely sculptured in stone: and the quantity of water is said to suffer little sensible alteration in quantity. The temperature is 88° 7′ Faht. at the sources: 85° in the pool. Temperature of air in shade 78°; time 7½ A. M. October. The approximate height of the springs above the sea is about 800 feet and the mean temperature of the surrounding country cannot exceed 80°. The water is remarkably clear, with a faint aqua-marina hue, and abounds in fish, some of considerable size—held sacred by the Sivaite priests. The supply is so abundant that after its escape from the pool it forms at once a considerable stream, part of which contributes to the supply of the great tank of Nandial about 10 miles to the westward of the springs. It is perfectly tasteless, contains a few bubbles of fixed air, and reddens litmus paper; oxalate of ammonia renders it slightly milky, nitrate of silver less so.

The formation of the surrounding country is the diamond sandstone and limestone invaded by trap dykes. Both diamond and lead mines lie in the vicinity.

There are two or three other smaller thermal springs in the thicket outside the enclosure of the temple: the temperature of which I was unable to ascertain at the orifices from their being choked up with vegetation. The temperature of the water in the pools they formed averaged about 85°.

I have little doubt that many other thermal springs exist in the diamond district, and throughout the line of dislocation of the eastern ghâts. Similar phenomena on a grander scale are remarked along those of the Himalayas, and western ghâts, where the earth and crust has been broken up from greater depths, and the deeper fountains of our planet have been thus brought up to fertilize its surface, and to administer to the wants of man and animals.

V.—*Description of a new species of Terrestrial Planaria, by* Mr. WALTER ELLIOT, *Civil Service. With a Plate.*

During the rainy months of the N. E. monsoon, numbers of long dark coloured slugs may be observed crawling about, among rubbish

composed of old wood and decaying vegetation, in the gardens around Madras. The Natives call them leeches, to which animals they certainly, at first sight, bear a considerable resemblance ; while the long train of silvery slime which they leave behind them in their course, seems to invest them with an analogy to the snail. But the extreme simplicity of structure apparent on a closer examination shows that they cannot be included either with the molluscous or articulated animals. They belong, in fact, to a species of the extensive and ill-defined genus—*Planaria.*

The body is long, soft, somewhat depressed and unctuous looking, and ends anteriorly in a flattened semicircular disc. This, which at first sight might be considered the head, is wholly unprovided with the usual organs. There is no trace of eyes, mouth, or tentacula; but instead of the latter the exterior edge of the disc seems to be invested with extreme delicacy of touch, exhibited in its great mobility and its power of contraction and dilation when brought into contact with opposing objects. Viewed from above, whilst the animal is in motion it presents a constantly undulating edge, but the under surface seems to be composed of numerous fine papillæ, which are sedulously applied to every substance encountered in its course, and are protruded and withdrawn, according as any portion of the edge of the disc meets with a foreign body, thereby giving it a somewhat crenellated appearance. The only other organ observable, is a slit or opening in the middle of the lower surface, somewhat more than half-way from the anterior extremity, whence a white membranaceous cup or syphon is exserted, serving the animal with the means of extracting the nourishment, drawn from decaying vegetation, on which it subsists. It may with truth be said to carry its mouth in its stomach. But this provision has only been seen after death. During life the orifice itself is not apparent, even with the aid of an ordinary lens, and I have never seen the cup or sucker in use.

Its motion in crawling is somewhat undulating, and appears to be effected by means of a strong muscle extending the whole length of the under surface or foot, the anterior extremity being generally raised and employed as a feeler. When it reaches the end of a leaf or twig it stretches forward in search of a new resting place, trying in all directions with the disc-like head. If nothing offers it stretches forward until nearly the whole body is disengaged, and it is left at length hanging from the posterior extremity, by means of the viscid secretion, which, on other occasions, marks its track,

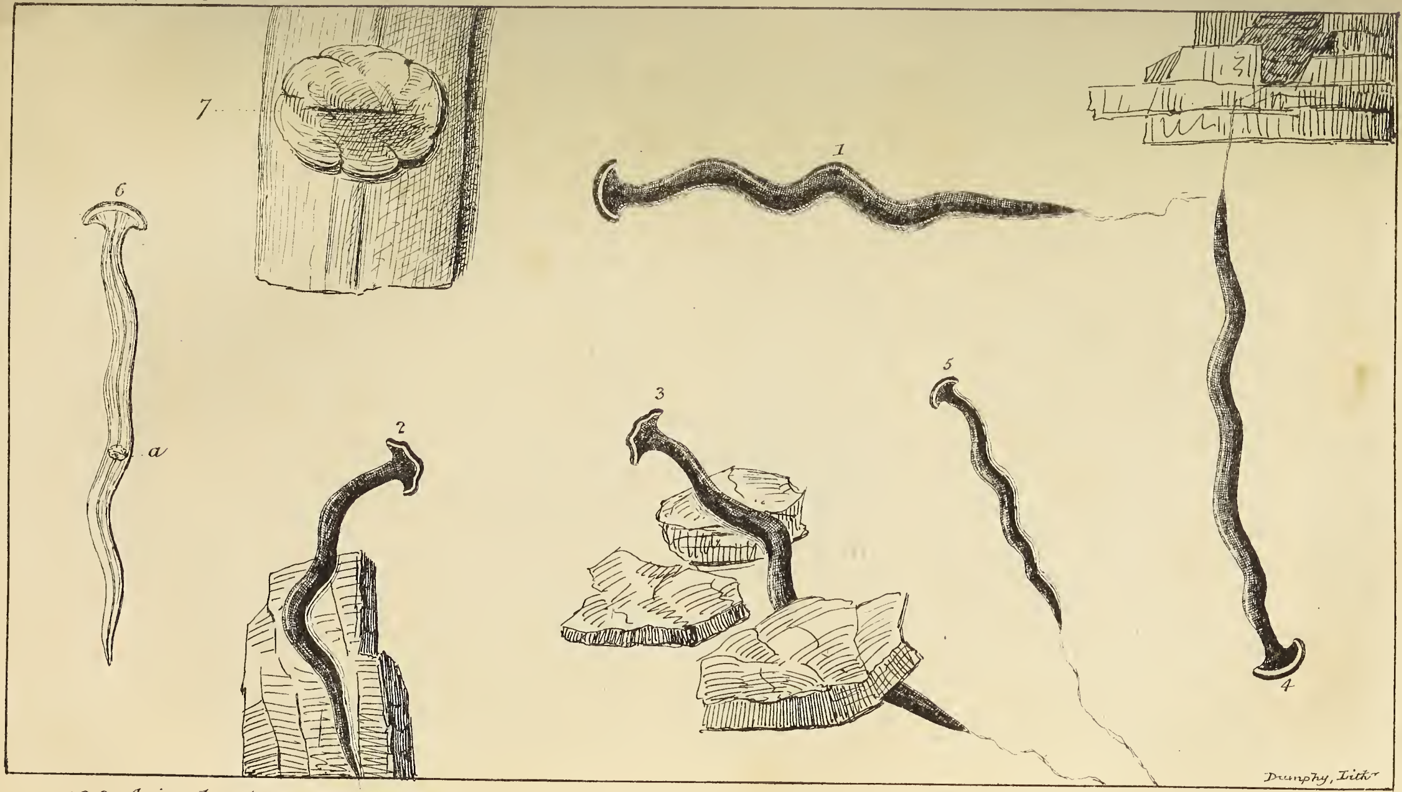
till it has descended to twice or thrice its own length, when the thread attenuates and breaks, and the animal falls to the ground. On meeting a smooth body, as a glass, &c., the lower surface of the disc is applied to it like a sucker, and the animal draws itself up, becoming thickened and corrugated by contraction, after which it disengages the head and pushes itself forward. It is impatient of heat, but not of light. When immersed in luke warm water it twists about as if distressed. In cold water, although exhibiting no signs of inconvenience, it always endeavoured to get out. When a bottle, in which some of them were kept, was placed in the middle of a basin of water to prevent their escape, they crawled out till they encountered the surface of the fluid, which at first they seemed unwilling to face; but, at length, after many attempts, and much apparent repugnance, some of the larger ones pushed forward their heads, retaining their hold on the cork by the tail alone, until they touched the edge of the basin on which the disc-like head was firmly fixed, and the body was drawn after it. One of them getting disengaged before it found the opposite side, tumbled about in the water as if helpless, until it again reached the cork on which it seemed gladly to take refuge, and returned to the bottle. Two or three others on finding the bottom of the basin below the cork, crawled along it under the water, appearing to find no difficulty as long as the abdominal muscle was in contact with the vessel. When immersed in cold water they invariably sought the surface of the bottle, crawling up the side, and clustering round the neck.

Although easily injured, and susceptible of division by the use of the slightest force, they are tenacious of life. When cut in two the portions continue to live and move as if unhurt, and each fragment would, doubtless, in time reproduce what was lost, so as to make a perfect animal. The aquatic *planariæ* are even said to reproduce their species by spontaneous division, as well as by depositing their ova. They seem to possess great powers of compression, effecting their escape through the narrowest apertures. On one occasion several of them, confined in a tumbler, contrived to squeeze themselves between the edge of the glass and the China plate on which it was placed.

This species of *Planaria* may be characterised as follows:

Planaria lunata (n. s.)

With a depressed, linear, opaque body dilating into a lunated disc at the anterior extremity; having no perceptible organs, excepting



1. 2. 3. Animal, as it usually appears.
4. Do. hanging from a piece of wood by the viscous secretion.

PLANARIA LUNATA.

5. Young Animal.
6. Lower surface of the animal – a. alimentary orifice.
7. Alimentary orifice, as seen after death, magnified.

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NATURAL HISTORY.

the alimentary orifice placed a little behind the middle of the body, as in the genus. Habits, terrestrial. Food, decaying vegetable matter. Length about 5 inches.

The colour is a uniformly dark brown, nearly black, except round the disc, which is white bordered at the very edge with pale brown. On examining the head (as it is most convenient to call this extremity) under a powerful microscope, to detect, if possible, the existence of organs of sight or touch, the surface of the paler portions around the white was observed to be sprinkled with dark irregular-shaped specks, which, to the naked eye, seemed the minutest points, but when magnified resembled well defined chromatogenous spots, in what appeared to be the cellular gelatinous mass of which the body was composed, the whole surface of which was covered with a moist secretion, apparently affording the material of the shining trail which it leaves in its course.

The genus *Planaria* originally established by Müller and afterwards restricted by A. Dugès on the aquatic species alone, was by Cuvier at first conjecturally, and afterwards on actual inspection, referred to the class of *Parenchymatous Entozoa* among the radiated animals, although, as he himself has observed,* *Planaria* and *Infusoria* afford almost the only instances among the animals brought under this great division, in which no trace of a radiated structure has been detected.

Their extreme simplicity of conformation, however, forbids the attempt to remove them to a higher place in the chain of being, but the great number of species discovered since the publication of the Regne Animal will probably lead to considerable modifications in the arrangement of the group. Some of the aquatic species described by Dr. J. Rawlins Johnson in the Philosophical Transactions† which were entirely aquatic, exhibited marks of a more perfect organisation in the apparent development of eyes and tentacula. They were also carnivorous and exceedingly voracious, preying even on their own race. Darwin also in the terrestrial species described by him notices numerous ocelli or black eye-like spots, variously distributed over the surface both above and below, which he considered to be imperfect organs of vision. In *Pl. elongata* however, a species from Tres Montes, in Western America, (lat. 46° 30′ S.) the largest he met with, and which approximates most nearly to ours, they were entirely absent.

* Regne Animal iii. p. 219.

† Phil. Trans. 1822, p. 437, ib. Plate xlix. fig. 24.

The genus *Herpa* determined by the late Rev. Lansdown Guilding* in the West Indies is evidently a kindred form. Swainson, misled by a desire to carry out his theory, eagerly caught at this discovery, and saw in it the first incipient development of the order of Phytophagous or pulmonary molluscs.† He even adopted *Herpa* as the first genus of his sub-family Limacinæ, making *Onchidium* a subgenus with *Herpa* proper. The common species of *Onchidium*, so common in the Carnatic, and which may often be found in the same haunts with our *Planaria*, will prove at once, to the most superficial observer, the anomalous character of this arrangement; the *Onchidium* being furnished with eyes, feelers, mouth, a mantle, a perfect internal system of respiration‡ and circulation, and complicated digestive and sexual organs.

* Zool. Journal, No. viii. p. 443.

"*Animal*, terrestrial, respiring by means of pulmonary vessels [pulmoniferum.] *Body* soft, sub-gelatinous, drawn to a point, elongated, contractile, depressed, much attenuated, anteriorly. *Mouth* at the extremity [apicule]—very minute, indistinct. No *tentacula*. No *mantle*. *Foot* the extent of the body, not well defined. With numerous ventral *glands* discharging a mucous secretion through transverse openings, and with a single larger one in the centre, from which a lobed cup [viscus] is rarely protruded, which is soft, pliable, and rather small."

"This genus is well marked and of a most unusual form. The Herpa glides along with the greater part of the body erect like a serpent, marking its track with slime, and directing its course, in the absence of feelers, by means of its long neck, greatly attenuated [or extended."]

"I have found the Herpæ on the decayed fronds of palms, on the summits of the highest mountains, and on the dry lands within a few yards of the sea: these always seeking cool places for concealment during the day, but never approaching the water, which, upon being thrown into, they instantly quit."

Mr. Guilding discovered three species in the West Indies, the largest of which, *H. gigas*, was 6 or 7 inches long. The only individual of the species, captured by him, escaped through a small crevice of the box in which it was placed, "from the strange power it possesses of contracting its body."—*Swainson. Appendix.*

† Lardner's Cab. Cycl. Malacology, pp. 161, 189.

‡ Guilding indeed in speaking of *Herpa* observes, "Genus Planariis facie quam "plurimum analogum, ut Limacides *respirationis* modo, locis moribusque, omni- "no affine." If the respiratory organs were indeed satisfactorily detected Herpa must be placed in a higher grade of the animal kingdom. But Guilding's description answers in all other respects so exactly to *Planaria*—terrestrial examples of which have been met with subsequently by Darwin and others in South America, Mauritius, Van Dieman's Land, New Zealand and other countries—that it is probable he was deceived in assigning this character. Dugés and Darwin suppose that the respiratory functions are exercised by means of vibratile cilia or some analogous structure disposed along the inferior surface or foot of the animal.—*Annals of Nat. Hist.*, V. xiv. p. 243.

Planaria lunata seems to be extensively distributed. I have observed it for several years past in various parts of the Carnatic, both inland and on the coast. Dr. Jerdon has met with it in Malabar, and Dr. Walker informed me it was found in Assam.

VI.—*Account of an attempt to form an Artesian Well at Tuticorin. From Official Papers.*

Amongst the numerous benefits for which we are indebted to the science of geology, the power of indicating the probable site of springs of water is not the least important, and especially so with reference to agriculture. The manner in which water is supplied from the sea, through the medium of the atmosphere, to fertilize the earth by rains, and to furnish a perpetual supply of water for the maintenance of springs and rivers is generally known, but the cause and origin of those subterranean springs, the locality of which it is the province of geology to indicate, are more obscure. Excess of water in large tracts of land can be permanently drained at small expense by methods which entirely depend on a consideration of the geological substrata; and the obtaining of a supply of water by means of perforating the earth depends also upon the same foreknowledge. An instance of this want of knowledge occurred a few years ago in England. A gentleman residing in Sussex having witnessed the successful attempts to procure water, by means of Artesian boring, in London and its environs, was desirous of having the same operation performed on his estate. After boring to a great depth, and undergoing considerable expense, he was informed that the project was hopeless: a result, of which any one conversant with the different geological formation (the Wealden sand) of that part of the country, could have informed him.

The modern method of obtaining water by means of perforations a few inches in diameter may, in time, supersede the more expensive mode of sinking wells; but the effort may prove fruitless, unless the geological structure of the district has been thoroughly investigated. A stratum of chalk of a green colour indicates water, and if the chalk is found mixed with clay and of a dark colour, it is a still stronger indication that the sheet of water, which it is intended to meet, is near. Some of these subterranean waters have an enor-

mous upward pressure. One at Roussillon rises from 30 to 50 feet *above* the surface. At Perpignan and Tours the water rises up with so much force, that a cannon ball placed in the pipe of an Artesian well is instantly ejected by the ascending stream. It is from this circumstance that these wells are called in Lincolnshire " Blow wells," and where they appear to have been as common as at Artois, from which place they derive their name. The Artesian well at the Royal Hospital, Haslar, furnishes more than 59,000 gallons per day, and is remarkable for its running through a stratum of shingle and running sand 125 feet thick, and full of salt water affected by the tides, but which has been stopped out. The whole depth is 156 feet. The deepest Artesian well with which we are acquainted is that at Grenelle, which is 1,584 feet in depth, and affords 500,000 gallons per day. To a country like India, where the supply of water is so variable and uncertain in many parts, the construction of these wells might prove of incalculable advantage, as they may be made at a much less cost than the usual plan of constructing wells of large diameter. The largest well that has ever been constructed is that made by Clement VII. at Orvieto, through solid rock. Its depth is 265 feet, and diameter over 80 feet. We mention this to contrast the immense labour and expense that must have been incurred, with those of the well at Grenelle, and which latter furnishes a larger quantity of water, with less trouble, and at greatly less cost.

We have again to furnish an account of another attempt to obtain water by an Artesian boring, of which we likewise furnish a section. We think that, in preference to the jumper, recourse might be had to the drill used in Hunter's stone boring machine, wherein sand stone is perforated with ease. A perforation first made with this instrument of about 2 or 3 inches in diameter would pave the way for a much more effective use of the jumper ; as stone is much more easily broken *around* a hole in it, than when the stone is in the solid.

The site selected for the experiment was on a neck of land north of the town, and within 50 yards of the sea, in a private compound, the property of Mr. Mather, at whose expense the experiment was carried on. Operations commenced on the 15th April, 1846, and were continued at intervals between that and the 21st July following, after which nothing was done in consequence of Mr. Mather leaving Tuticorin. An excavation 12 feet square by 4 feet deep was first made in the sand. The triangle was then fixed in its place, and a

stage of planks formed for the people to work on. I should mention that salt water was met with at the above depth. The next thing was to fix one of the 6 inch diameter iron pipes in the centre of the pit, after which was done the boring commenced.

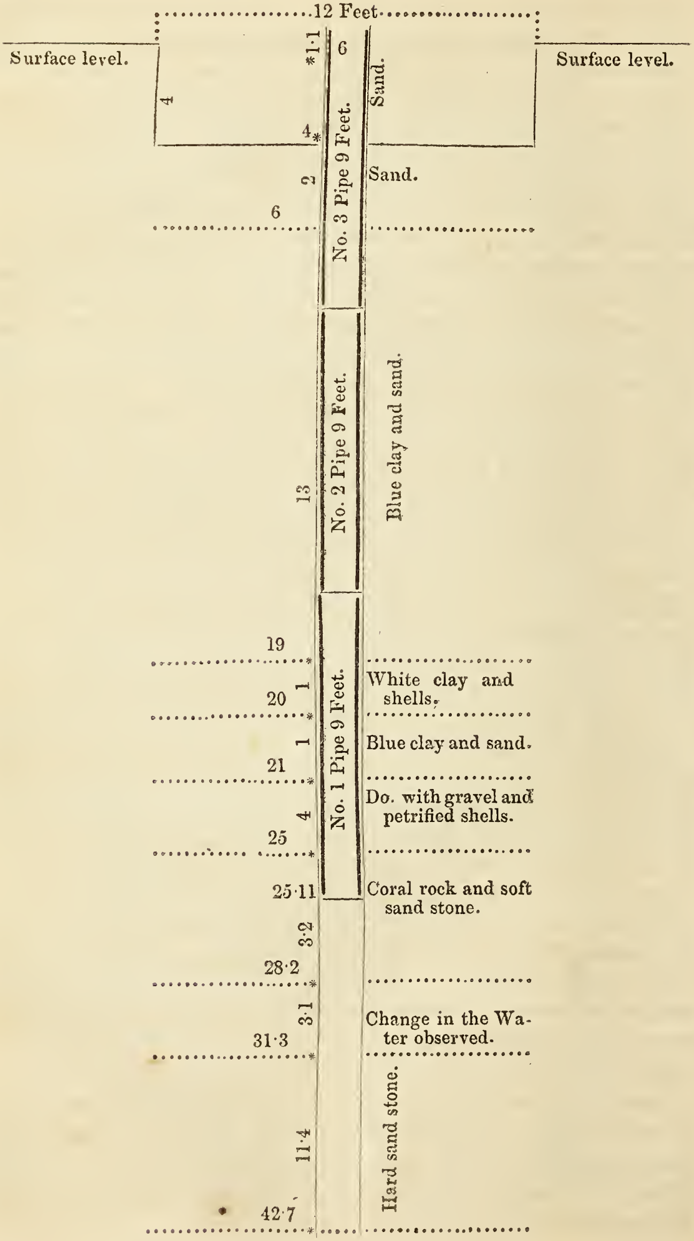
The nature of the soil bored through (sand and blue clay mixed, the former, however, predominating) made it advisable to use an auger, and occasionally an instrument termed a shell, furnished with a valve opening upwards to raise the water as well as sand from the interior of the pipe. Every time the auger was removed the head of the pipe was struck with a heavy wooden rammer, to assist its descent, and in this way 6 feet of pipe were inserted the first day. On the 16th the second pipe was fitted on (each pipe being 9 feet in length) and driven down to the depth of 5 feet, making 14 feet in all. At this depth there was no difficulty in keeping the bore free of water by means of the valve shell. The soil brought up continued to be of the same description as before, but the ingress of water was much less than on the first day. On the 17th, the second pipe was driven to a level nearly with the surface of the water in the pit, or about 19 feet from the surface of the ground, at which depth a much firmer clay, with shells intermixed, was met with. It was found necessary to loosen this a little by means of the screw auger, before the common one was introduced, and even then some difficulty was experienced in working through it. The percolation of water from below was very trifling. A small crabwinch was used for raising and lowering the boring rods as occasion required. The party engaged on the work consisted of 16 men, 8 of whom were employed alternately in turning the auger and raising the rods. From the 17th to the 27th idem very little progress was made in the bore, owing partly to the heavy rain which fell in the interim, and partly to the breaking of the iron pin connecting the upper and lower boring rods, whereby the latter was left at the bottom of the bore, and had to be drawn up separately. In doing this, the rope, to which the lifting instrument was attached, broke, and both fell to the bottom together. A long iron bar hooked at one end was then introduced into the bore, and by its means the broken part of the rope, with the instrument attached, was drawn up. The next attempt, with a stronger rope, was successful in withdrawing the lower rod from the bore, and a new pin being inserted the boring proceeded. At the depth of 20 feet a whitish clay with

shells intermixed was met with. To this succeeded one foot of the blue clay and sand before described, then 4 feet of the same with gravel and petrified shells. By the evening of the 28th idem the pipes had been driven to a total depth from the surface of the ground of $24\frac{1}{2}$ feet. The last 2 feet were driven with a heavy pipe driver, weighing about $\frac{1}{4}$ ton, and let fall from a height of 4 or 5 feet. Nothing less than this could overcome the friction on the sides of the pipe, and force it through the subsoil. It should be mentioned that when the pipe had descended below the layer of blue clay and sand, the ingress of salt-water from beneath became much greater, and could not be kept under as before by the use of the shell. It was necessary, therefore, to force the pipes down into a less pervious stratum, in order to keep the bore as free as possible of salt-water.

In boring through the last 4 feet the triangular jumper was substituted for the auger, and the shell used for clearing the bottom of the bore every now and then, as occasion required. Next came coral rock and soft sand-stone, through which the jumper made about 6 inches in the hour, so that by the evening of the 29th idem, the total depth of the bore, reckoning from the surface of the ground, was 28 feet 2 inches, or 2 feet 3 inches below the bottom of the pipe, which latter was driven to 25 feet 11 inches, on the last mentioned date. The S jumper appeared to answer better than the triangular one. From the 29th April to the 5th May the boring was continued through sand-stone of a harder description, to the depth of about 6 feet below the bottom of the pipe, but great difficulty was experienced in keeping the bore free of water, which rushed in below the pipe almost as fast as it was drawn out above. It was found impracticable to drive the pipe any further, owing to the stratum of sand-stone on which it rested. It was observed that the water drawn up from the bore was less salt than before and there was reason to infer, therefore, that there was fresh water mixed with the salt, and that if we could but keep the latter out, our labour would not be in vain. To effect this it was proposed, after the jumper had bored another foot or two, to insert a smaller size pipe within the one first driven, and to lower it into the bore formed by the jumper, and then to force down a quantity of stiff clay between the two pipes so as to cut off the communication, and stop the rise of salt-water from below. In boring, however, the additional 2 feet an accident occurred, whereby a piece of the pipe, it was supposed, was broken off and remained at the bottom of the bore. A few small pieces of iron were

brought up in the shell, and rather than lose time and spoil the jumpers in working through this, it was deemed advisable to commence a new bore in the immediate vicinity of the old one. The new bore was accordingly commenced on the 25th May, on which day the auger bored 18 feet below the surface of the ground, and pipes were inserted to the depth of 12 feet. On the 26th the auger, jumper, and shell together bored a further depth of 6 feet, making 24 feet in all ; and the pipes were driven 10 feet or 22 feet from the surface. On the 27th the jumper and shell only were used, the former to break through the hard coral rock, and the latter to clear the bore from time to time. On the 28th 4 inches only were bored through hard rock with the jumper. On the 29th the pipes were driven 6 inches, and it was found that the sand filled in the bore from the bottom to the height of 6 feet. A quantity was raised with the auger, when it filled again. On the 2d June the pipes were driven 2 feet, and the sand again withdrawn. The jumper this day made 6 inches through hard sand-stone. On the 4th a further depth of 4 inches was gained, and in this way the boring continued with occasional interruptions till the 20th July, 1846, by which date a total depth from the surface of 42 feet, 7 inches, was attained, and the water brought up was much less salt. On the 21st July, the large pipes were filled with clay and one of smaller size inserted within. Here the experiment ceased, in consequence, as before stated, of Mr. Mather's sudden removal from Tuticorin. It is the firm belief that fresh water exists at the depth to which the boring had been carried, and that if it were possible to build out the salt-water, a sufficient quantity of fresh might be obtained to supply the port and shipping, and that in the immediate neighbourhood of the beach, instead of bringing it from a distance of 2 miles in chatties, as at present. It was intended, had the first experiment fully succeeded, to have recommended the construction of a well in the centre of the town, near the Post Office and within a short distance of the beach, for the convenience of all parties. The change in the water was first noticed at the depth of 31 feet, 3 inches, after the jumper had worked through about 5 feet of the sand-stone rock, so that if a well were constructed it would require to be built from this depth upwards to keep out the salt-water.

With so little data to go upon, it is difficult to frame an estimate of the probable expense of such a work, but it is supposed that Rupees 1,000 would be sufficient, provided Government supplied pumps to keep the excavation free of salt-water during the progress of the work.



12 Feet
Surface level.
Surface level.
*1·1
6
4
4*
Sand.
No. 3 Pipe 9 Feet.
2
Sand.
6
No. 2 Pipe 9 Feet.
13
Blue clay and sand.
19
No. 1 Pipe 9 Feet.
1
White clay and shells.
20
1
Blue clay and sand.
21
4
Do. with gravel and petrified shells.
25
25·11
Coral rock and soft sand stone.
3·2
28·2
3·1
Change in the Water observed.
31·3
11·4
Hard sand stone.
42·7

VII.—*Analysis of Mackenzie Manuscripts.*

(Supplement continued.)

B—TELUGU.

A—Palm-leaf Manuscripts.

I.—1. *Mādhava Bhyudaam*, or adventures of *Vishnu*, No. 97, C. M. 381. The principal subject of this poem, in the *Padya Cavyam* metre, is the ten metamorphoses of *Vishnu;* composed by *Mādhavuduru Guruvaya Kichchaya*, son of *Guruvaya* of the house (or lineage) of *Mādhavuduru*, at the desire of *Nāgarāja*, son of *Kariappa*, a local chief of the Nellore district.

In the opening portion, there is an account of *Nandirāja* of *Nandivaram*, who by favor of a Brahman had acquired the power of visiting *Cāsi*, or Benares, by an aerial transit; and was accustomed to take his wife with him: until by a transgression of rules as to a certain four days observance, occasioned by his wife, he lost the said power of making aerial voyages. However he regained the faculty by making largesses to *Brahmans*, leading to the influx of a colony of Brahmans to his town, or capital, at *Nandivaram*. This part is introductory.

The patron of the poet dictated as his subject the *avatars* of *Vishnu;* which are then poetically narrated.

1. *Matsya.*—The rescue of the *Vedas* from *Sòmacāsura.*
2. *Curma.*—The churning of the milk sea, by means of *Mt. Mandara*, to produce nectar for the celestials.
3. *Varaha.*—The killing *Hiranyacsha*, who had rolled up the earth like a mat, and carried it away.
4. *Narasinha.*—The killing *Hiranya casipu.*
5. *Vāmana.*—The trampling upon *Bali-chakraverti.*
6. *Parasu Rāma.*—The destruction of the *Cshetriyas.*
7. *Rama Chandra.*—The destruction of *Rāvana.*
8. *Bala Rama.*—The story of the elder brother of *Crishna.*
9. *Crishna.*—His early adventures; marriage with *Rucmeni;* and other actions.

The composition of the work is stated to be good. It is very full of Sanscrit words, or derivatives.

Remark.—The story of *Nandi* of *Nandivaram*, heretofore occurred in a *Mahratta* book, with a prevailing similarity to the account in this one; its chief use is with respect to the past history of colonizing Brahmans. Of course the account of *Vishnu's avatāras* can offer nothing new.

Note.—The Manuscript is complete, and of recent appearance. It is entered in Des. Cat., Vol. 1, p. 329, Art. 35.

2. *Lacshmi-vilāsam*, or an account of *Lacshmi*. No. 81. Countermark 380.

Reference to the second *avatāra*, or churning the sea, in the midst of which *Lacshmi* was born, or produced; with many other valuable things. A description is given of her form, perfections and accomplishments; with the general statement of her becoming the wife of *Vishnu*. Other circumstances, connected with the churning of the sea, are stated. There is also a genealogy of the lunar race, of the line of *Janamejaya*. The poem is in the *Padya Canyam* metre, with a variety of included metre; written by *Rayasa-vencata-pati*, who states that he was directed to write it by a vision of *Vencatapati* (the name of *Vishnu* at *Tripeti*) appearing to him in a dream. It is complete in five sections of comparatively recent appearance; the last leaf only being very slightly damaged. It is entered in Des. Cat., Vol. 1, p. 329, Art. 34.

3. *Rādhā-mādhava Samvādam*, or difference between *Radha* and *Crishna*. No. 63. Countermark 398.

Some panegyric of the poet's patron, a local chief, is given. The statement of the tale, by a strange anachronism, is said to be by *Savunaca rishi* to *Dasaratha*. The subject is *Crishna's* desertion of his wife *Rādha*, by reason of his other marriage with *Rucmeni*. A parrot is sent by *Rādha* to *Dwāraca*, in order to discover what had become of *Crishna*; giving occasion to much poetical hyperbole, in a description of the person of *Crishna*, his court, and the like matters. Of such a poem a brief indication is amply sufficient. The book is complete in three sections, composed in the *Padya Cavya*, by *Vencatapati*, son of *Tiru Vengah ācharya*.

One or two palm leaves at the beginning, and a few at the end, are damaged by insects.

NOTE.—It is entered in Des. Cat., Vol. 1, p. 33, Art. 45.

4. *Devaci nandana Satacam*—a poem concerning *Crishna*. No. 73. Countermark 360.

This is a small manuscript, and contains one hundred and two Stanzas of the *Padya Cāvyam* kind. Some other verses, as also the poet's name, usually given at the end, are wanting. Its subject is *Crishna*, the son of *Nandana* and *Devaci*, and relates to his early life, his youthful sports, and his marriage with *Rucmeni*; but does not enter into the warlike actions of this hero. A thousand names are ascribed to him, and the result of meditation, upon his excellencies, is stated to be future beatification. Such statements indicate extraordinary infatuation; but I usually spare remark. The book is a little damaged by insects.

It is entered in Des. Cat., Vol. 1, p. 324, Art. 19.

5. *Nandala Crishnama rāju vamsavali*, or genealogy of *Nandala Crishnama*, a chief. No. 135. C. M. 319.

This is a mere fragment of a work, which I understand, if complete,

would contain six *asvadas* or sections, under the title of *Kālī purnōdaya.* This M. S. has merely fourteen palm leaves from the commencement; all the remainder being wanting. It contains a mention of the family, and immediately preceding ancestors of a local chief, named *Crishnama;* and the prefix *Nandala* intimates a town of that name, either as his birth-place, or chief town. There appears to be nothing in it of general consequence.

It is entered in Des. Cat., Vol. 1, p. 306, Art. 9.

6. *Surabhāndèsvara,* legend of a *Saiva* image. No. 50. Countermark 496.

Another copy. No. 51. Countermark 410.

This is a tale concerning a *Brahman,* who became infatuated by the venders of spirituous liquor, and justified himself by the example of *Crishna.*

In the end he was concealed, and stifled to death, in a jar of ardent spirits. Owing to the *Brahman's* former merit, his dead body, and the jar, were transformed into a *Saiva* emblem: now said to be worshipped at Benares as *Surabhāndèsavara;* or the *Spirit-jar-god.* It is added that those who bathe in the river there, and hear this book read will go to *Cailasa.* The poem was written in *Padya Cavyam* metre, by *Ghotlie* son of *Yellaiya.*

The copies are both very incomplete; so much so as to render any minute specification needless. Notwithstanding the gravity of the conclusion, which is affected, the whole is a lampoon upon the *Brahmans;* whether votaries of *Crishna* or *Siva*; and the conclusion seems to be a sarcasm on the close of most *purānas*; the simple hearing of which is generally said to ensure beatification.

Both copies are entered in Des. Cat. Vol. 1, p. 339, Art. 58.

7. *Cailasa nat'ha Satacam,* a poem on the lord of *Cailasa.* No. 88. Countermark 371.

There is a scrap of three palm leaves containing a few stanzas on the war between *Rāma* and *Rāvana.* The *Satacam* follows having the beginning, but incomplete at the end. It is copied in different hand-writings; and the whole has an appearance of age. Some of the leaves are broken by wear. The subjects are—a reference to *Siva* assuming illusory forms, mingled with matters relative to intercourse of two classes of human kind. Homage to *Devi,* the consort of *Siva.* The panegyric of *Timma Bukha rāja,* including his ancestors, tribe, and other eulogistic matters. There follows a philippic against the *Cōmti* tribe, or traders and bankers. The remainder is wanting.

Note.—The Manuscript is entered in Des. Cat. Vol. 1, p. 327, Art. 27, but the brief entry is defective.

8. *Ganita Trirasecam.* No. 115. Countermark 497.

A fragment of three old palm leaves, of a work on Arithmetic; which is large when complete.

NOTE.—It is entered in Des. Cat., Vol. 1, p. 356, Art. 23.

9. *Crishna raya agrahāram cheruvu purvottaram.* No. 126. Countermark 311.

The title of this Manuscript implies a record concerning a water reservoir, attached to a *Brahman's* alms house, built, or formed by *Crishna-rayer*. The book however has four parts; the subjects of which appear to be distinct.

1. The first part seems to be the one denoted by the general title. In consequence of bursting of the banks of three reservoirs belonging to an *agrahāram*, the *Carnams* or *Brahman* accountants of the district, applied to *Crishna-rayer* for aid, which he liberally afforded. In this part there are only three small palm leaves, a little injured by worms.

2. A fictitious tale in Native Telugu respecting *Acása raja*, the son of *Mitra-verma* of an imaginary locality termed *Narayana-vanam*. It is written on six palm-leaves, recent, and in perfect preservation.

3. A sort of lampoon on *Brahma*. One day when *Brahma* and other celestials, were going to *Cailasa*, they passed by *Subrahmanya*, to whom *Brahma* only paid no homage. At this *Subrahmanya*, being angry, demanded the reason; when *Brahma* replied that he did not worship him on account of his youth. *Subrahmanya* then took from him his power and dignity, as creator, and told him (*Brahma*) that henceforward he would exercise this power himself. *Brahma* besought its restoration in vain. On going to *Cailasa*, and stating the case, *Simudi*, or *Siva*, instructed him to repair to a certain hill at *Conjeveram*, and there to perform penance, when *Subrahmanya* would come thither, and restore to him his power of creating: the direction was obeyed; and the restoration of power followed. This pasquinade is written in Native Telugu, on seven palm leaves: and has an appearance of being taken from the *Conjeveram St'hala puranam*, which has many such sarcasms directed against *Brahma* and *Vishnu*. It resembles accounts contained in local legends at *Pyney* and *Tripeti*.

4. The legend of *Casyapa* and his two wives *Diti* and *Aditi*, with the myriads of their posterity; the building of a city in the air, as the capital of *Indra;* and similar legendary matters, taken from the *Puranas*.

This part is written on twelve small palm leaves, rather old, and injured a little by insects, and use.

NOTE.—The Manuscript is entered in the Des. Cat., Vol. 1, p. 301, Art. 3; but the brief notice given has reference to the first, and smallest part of the book.

10. *Calādharo-pakhyanam.* No. 71. C. M. 372.

The title is derived from epithets applied to *Vishnu*, and a word denoting *elucidation*. It is a production in ornate verse by *Vencatapati* of the *Nandavaram* race, professed to be recited in the hall of *Timma raja*, as I suppose at *Penna conda;* and his genealogy of course is given, with laudatory panegyric. The remaining and principal subject of the poem

is an extravagant romance, with respect to which it may be quite sufficient to refer to the adequate, though brief notice, in the Des. Cat., Vol. 1, p. 327, Art. 28.

NOTE.—The Manuscript is quite fresh in appearance and uninjured. Out of six books of the poem, when complete, there is only one book contained in this copy.

11. *Vipra narāyana cheritra.* No. 134, C. M. 302.

The subject of this poem, in the *divi pada* measure, is either to frame an apology for the theft of a valuable utensil from the shrine at *Srirangham* near to Trichinopoly; or else to feign that circumstance, as a *vehiculum,* for matter of a gross, and sensual character. The period of occurrence, as to the leading incident, is placed in the time of a *Chola raja,* no name being specified. It seems to me a work merely of invention; though some such incident may very likely have occurred. From various books, thefts by servants, in different fanes, may be observed to be no uncommon occurrences. There is quite a sufficient entry respecting this Manuscript in Des. Cat., Vol. 1, p. 347, Art. 67, to which I refer.

NOTE.—With the exception of the first leaf, on which the name of the writer would appear, which is now wanting, the poem is complete. The appearance of the Manuscript is old, it is untouched by insects; but a little broken at the ends, by wear or usage.

12. *Capôta-vācyam.* No. 129. Countermark 375.

The subject of this composition in the *vāchana-cavyam,* is a sort of fable stated to have been delivered by *Rāma* to *Sugriva,* when he needed the help of the latter, and his foresters, in the war against *Rāvana.* The substance is the willing devotedness of a dove that gave itself to death, when its mate had been previously killed, and some similar matter. The moral of the fable seems to be to urge the exposure of life in the recovery of *Sita;* both the life of *Rāma* and of *Sugriva,* with his sylvan followers.

NOTE.—The first leaf and writer's name are wanting: the remainder is complete, and damaged only by wear.

13. *Brahma-nāyaki-dandaca.* No. 123. Countermark 468.

The *dandaca* is a species of composition of the plainer kind. This Manuscript is by *Siva ramâiyer* of *Tiru-corna-mane,* a village in the *Tondiman's* principality near Trichinopoly. The subject is the eulogy of the *Sacti* or local goddess of the *Saiva* class, of which the writer was a votary. It is quite a recent copy, and in the large and rude hand-writing apparently of a school-boy. Any entry in the Des. Catalogue is not apparent; though it has the usual marks of classification.

14. *Tiru-calacodi-purvottarum.* No. 125. C. M. 291.

This is a fragment of six small palm leaves. It is a local legend of a *Saiva* shrine, in the extreme south; a site of military operations in the early part of this century: according to which *Agastya* and *Pulast'hya*

were ardent votaries of *Siva;* insomuch that the latter cut his body to pieces, and the former threw himself into a pit of fire, in testimony of entire devotedness. The account however remains very imperfect.

An entry occurs in Des. Cat., Vol. 1, p. 278, Art. 24.

15. *Keyura-bahu-charitra.* No. 44. Countermark 377.

This Manuscript contains a series of tales made to rest on a fictitious supposition of the minister of *Keyura-bahu*, a local chief (alleged to be of the *Surya vamsa*) narrating persuasive arguments to *Ratna-Sundar* daughter of a king, or chief of the *Chandra-vamsa*, to induce her to marry the said *Keyura-bahu.* From the genealogy it would appear that *Keyura-bahu* is intended to designate a petty ruler descended from the *Reddis*, who before had held extensive authority in *Telingana.* There is no historical value attaching to this document.

NOTE.—It is deficient at the end: the preceding portion is regular from the beginning: it is rather an old M. S., and damaged by worms; needing however only a degree of care for its preservation.

16. *Narukur-pariyātam.* No. 89. Countermark 687.

A drama by the poet *Narrayana Appava* of the village of *Narukur;* composed in the *Padya-cavyam* measure, and dedicated to his patron *Bangaru Yachama Nayadu*, the ruler of the *Vellugotivāru* race at *Vencatagiri.* The subject is ornamental and fanciful. *Crishna* when ruling in *Dwāraca-puri* had eight wives, to one among whom, that is *Rucmeni*, he presented a flower of paradise; which excited the jealousy of *Satyabhauma*, another of his wives, who entreated him to procure for her the flower named *Pariyata*, and to satisfy her *Crishna* sent to the paradise of *Indra* for the said flower; which was procured and given. The object of such a drama, of course, was to please the poet's patron; and get a reward.

NOTE.—The Manuscript is a fragment, and has sustained damage by breaking of the leaves.

It is entered in the Des. Cat., Vol. 1, p. 332, Art. 41.

17. *Chandra-bhānu Cheritra.* No. 53. Countermark 354.

A tale composed in the *padya-cavyam* by *Mallana*, at the desire of *Vencatapati*, son of *Tirumala-rayudu* (of *Chandra-giri* I believe.) The subject is taken from the family of *Crishna.* By *Rucmeni* he had a son named *Manamudu*, and by *Satyabhauma* a son named *Chandra-bhanu.* The latter is the hero of the poem; and there is also a heroine. The subject being suggested from a passage of the *Bhāgavatam* is amplified in Telugu verse.

NOTE.—This Manuscript is complete, of recent copying, and in perfect order. It is entered in Des. Cat., Vol. 1, p. 322, Art. 13.

18. *Bhogini-Dandaca.* No. 80. Countermark 350.

The *Dandaca* is a species of composition that has been elsewhere describ-

ed: it is a sort of homage to some *Sacti* of *Siva.* Such is the case in this instance, *Bhogini*, being a local name of an evil goddess. This *Sacti* was long worshipped by *Sarvajna-Singha-rao*, a local chief; and, at length the said goddess appeared to him in a vision, and told him she wanted blood. To appease her, he cut his own throat; and the evil demon first being gratified by drinking his blood, then touched the wound and healed him. The poem was composed by *Bommanapotu rāja*, a writer of eminence in Telugu literature.

NOTE.—The Manuscript is merely a fragment; very little is written on each leaf in a large hand-writing.

It is entered in Des. Cat., Vol. 1, p. 321, Art. 10.

The real character of the book is therein veiled.

19. *Lacshana-Chudāmani.* No. 92. C. M. 486.

This is a philogical work, on the formation of the *Telugu;* containing also notices of various *Telugu* works of reputation. It seems to be not merely a book on the art of writing; but also a directory, and critical estimate of the value of standard works. Besides it contains an account of the *Niyogis*, or secular Brahmans; whom the M. S. books of this collection show to have obtained extensive settlements, and power, in the northern Circars, under the *Ganapati* and other princes. As a work of reference this Manuscript is stated to be valuable. It is composed in the *padya-cavyam* by *Casturi Rungaiya* son of *Crishnaiya*, of what town or place does not appear in the work. It is old in appearance: but is complete, and very slightly injured.

NOTE.—It is entered in Des. Cat., Vol. 1, p. 353, Art. 3.

20. *Rājavetti. Vira Bhadra dandacaveli.* No. 54. C. M. 294.

This is only a fragment of a legend of the fane of *Vira-Bhadra*, at *Ragavetti*, near Cuddapah. It is represented to be a very ancient foundation; greatly enriched by donatives from many kings. The names of *Crishna-rayer*—and *Achyuta-rayer* are mentioned among others. On the country coming under the English, the then Collector of the Ceded Districts, Mr. Munro, (afterwards the Right Honorable Sir Thomas Munro, Bart., Governor of Madras,) had the grants investigated, and restored to the fane, all its ancient rights and privileges.

The work when complete I am told is a large one. It is entered in the Des. Cat., Vol. 1, p. 279, Art. 25.

21. *Ambarisha Cheritra.* No. 47. C. M. 339.

A poem in five sections, in the *Padya-cavyam* metre, composed by *Ranga-Sayi;* as stated by the express command, and inspiration of *Rama.* It is however a borrowed tale from the *Purānas*, respecting *Ambarisha*, king of *Saketa-puram*, that is *Ayoddha.* The leading incident is the said king's going out to hunt in a forest, meeting there with the daughter of *Casiyapa*, and ultimately marrying her. Subsequently he devoted himself to a life

of abstract devotion: and the *Chacra* of *Vishnu*, effecting an interposition in his behalf, took him to the other world.

NOTE.—The five sections are complete; and the Manuscript is in good preservation. An entry occurs in the Des. Cat., Vol. 1, p. 317, Art. 2.

22. *Charu-chandrōdaya.* No. 86. Countermark 357.

A romance narrating the adventures of *Charu-chandra*, a son of *Crishna* by his wife *Rucmeni*. The adventures are of the wildest, and most extravagant kind. The leading outlines are—a hunting excursion—meeting with a *rācshasa*—visit to the superior world of *Brama*, and then to the world of *Indra*—whence he obtained a celestial car—he then fought with and overcame the *rācshasas*. Subsequently he formed an attachment and married; which is the conclusion of the poem. This is written in *Padya-cavyam* metre, by *Chennama raja.*

NOTE.—The Manuscript is old, the leaves are broken at the edges; but the writing inside, which is very neat, remains in perfect preservation: the book is complete. It is entered in Des. Cat., Vol. 1, p. 323, Art. 16.

23. *Tinnur-St'hala-mahatmya.* No. 106. Countermark 293.

This legend is stated to have been narrated by *Crishna* to *Arjuna*, at the latter's request. The leading topics are the penance performed by the seven great *rishis* at this place, and the appearances vouchsafed to them by *Vishnu*, under the forms of his principal incarnations. The work is written in the plainer kind of verse termed *Vachana-cavyam.* The writer's name does not appear, the document being incomplete. What remains is in good preservation.

NOTE.—It is entered in the Des. Cat., Vol. 1, p. 279, Art. 26.

24. *Rāghava-pāndaviya.* No. 41. Countermark 395.

This is a poem of difficult construction, and is represented as delivered by *Savunaca* to *Suta-rishis.* The verses are capable of a double sense. Being read in one way, a part of the contents of the *Ramayana* is given; concerning the marriage of *Sita* and the crowning of *Vibushana;* while, in another sense, a part of *Bhārata* is represented, referring to the marriage of *Draupedi* with the five *Pandavas*, and connected incidents. The Manuscript is very defective; and the name of the author does not now appear in it. It is old in the copying; but the fragment remains in tolerably good preservation.

NOTE.—It is entered in the Des. Cat., Vol. 1, p. 334, Art. 48.

Herewith the whole of the Telugu *Palm-leaf* Manuscripts have been attended to, by analysis, abstract, or indication as to need of being translated.

b—MANUSCRIPT BOOKS.

1. 2.—*Manuscript Books. No.* 4. *C. M.* 305, *and No.* 5, *C. M.* 306.

A series of tales by *Somana-radyalu* who gives his parentage, and proceeds to relate a variety of notices of specially distinguished votaries of

the *Uttra-Saiva* system, which maintains the sole supremacy of *Saiva;* the virtue and efficacy of all rites, and symbols pertaining to that mode of worship; and with laudatory praises of those who had gone farthest in their proceedings against votaries of other systems. The writer seems to have been a follower of *Basavudu*, the *Vira Saiva* leader. His zeal may be estimated by the extent of his performance. The first part contains 2,000 *dwi-pada* stanzas, the 2d part 2,500, the 3d part 2,120—and these are contained in two thin quartos; being consecutive volumes; the last of which remains incomplete—the copyist apparently having proceeded no farther. There is much in these narratives borrowed from sources already noticed in these researches; but, as a whole, the document is adapted to throw strong light on the extreme *Saiva* sect; to whom, in the days of their power, such an epithet as "mild Hindus" would have been a misnomer.

No. 4 has suffered a little from the book-worm, but not to a serious degree; the other volume remains in moderately good preservation.

3. Manuscript Book. No. 7, C. M. wanting.

Cāvyālancara-chudāmani, a book on rhetoric.

A work in the *padya-cavyam* metre, on Telugu grammar, prosody, tropes, and poetical ornament in general: as such incapable of being abstracted.

It is not complete at the end: and though touched by worms, remains in moderately good preservation.

4. A fragment of loose papers, without covers, mark, or number.

1. Account of *Sringa-varam* near Vizagapatam. The earlier portion of this paper relates entirely to the fabulous origin of some fanes and shrines. It ascribes the first formation of the wilderness into a colony to one named *Tri-sula-bhupati*, which seems a mere title. Afterwards three classes of aborigines named, respectively, *Savaralu*, *Bhagadulu*, and *Gatamalu*, chose for themselves a king or chief, ruling the whole, whose name was *Nila-cant'ha* (also an epithet of *Siva.*) This chief's son was named *Siva Rama*, and a few names of his descendants, with very little of incident, follow. The country fell into a state of anarchy: and, at the time when the paper was written, it was under the Honorable Company's Government, paying an annual revenue-tax of ten thousand rupees.

2. Account of different tribes in the *Jaya-pur* district: these are 1, the *Miaka-rajas*. 2, the *Gailutus*. 3, the *Sagidi-vāndlu*. 4, the *Sondi-vāndlu*. 5, the *Ayara-cula* people.

The first are wild people, distinguished from the *Condu-vāndlu*. The second are rude, and given to the use of intoxicating liquor. The third are servile labourers in husbandry; not, like *Hindus*, attached to the soil, but working for cooly-hire, or daily wages. The fourth are engaged in drawing the sap of different kinds of palm-trees, the fermented juice of which they sell, and live thereby. Some of these are

Saivas, and some *Vaishnavas.* Of the fifth class nothing is mentioned except that they assimilate more closely to the *Saivas* among the *Hindus.* A list of towns, with details as to fields under cultivation, is appended.

4. Account of *Conda, Cambedu, Gòluconda,* and *Gudam.* The opening part of this paper has a detail of rivers, or streams, by which the country is watered and fertilized; with notice of paths, or tracks, amidst the mountains. In reference especially to the village of *Gudam*, it adverts to the before-mentioned *Nila Cant'ha,* ascribing to him the first settlement, and partial civilization. From his *Hindu*-name, it would appear, that he was a foreign colonist, who brought the wild tribes of aborigines to submit to his guidance. The whole of the above mentioned districts submitted to his rule. Details of local chiefs occur, and occasionally notice of intercommunications with the *Gaja-pati,* and *Gana-pati* princes. But the notices given are evidently only of what may, by indulgence, be termed baronial families. Beyond family successions, alliances, or discords, there is nothing of consequence.

5. Account of the *Toki* festival among the *Savaralu,* the *Conda-savaralu,* and *Malijala-savaralu.*

This festival is annually held, and forty or fifty villages unite in its celebration; choosing one village by turn for the site of operation. It is done in honor of *Jagrata-devata* the local *numen.* According to this paper they make the most important part of the preparation four or five months before the time fixed on for the festival: and that by selecting some friendless man, or woman, of the age of twenty-five, or twenty-six years; who being without relations or protectors, is seized and put into confinement, being highly fed, and allowed the free use of intoxicating beverage. At the time of sacrifice, this victim is taken out in public procession, for eight or nine successive days, proceeding round the village wherein the sacrifice is to be held. The precise act is held at four o'clock in the morning, or an hour or two before sunrise. The victim is then killed by a weapon herein termed *Ganda-godali,* and the blood is used as an offering to the aforesaid idol. Nothing is herein mentioned of eating the flesh of the victim. The person is always kept in a state of intoxication; and is usually insensible at the time of sacrifice. The people imagine that by this sacrifice they increase the fertility of their lands, and render their villages more valuable.

Remark.—The papers of this fragment are damaged; but with exception of the last they do not seem of such importance as to claim restoration. In this last section I have unexpectedly met with the account of those human sacrifices, which when lately* made public in the Goomsoor campaign created so great a sensation. The details herein given correspond substantially with those then announced; the sole fact of Cannibal-

* This abstract was first made in 1838.

ism being excepted. The record in these papers ought I think to be preserved: and in consequence of that opinion I have had this section restored.

4. Manuscript Book. No. 13, Countermark 343.

Section 1. *Aniruddha Cheritra.*

This is a mere romance. It is divided into five parts, and is composed in the *padya-cāyam* metre, by *Abhayāmatya.* The subject, in brief, is the following: a powerful king symbolically represented as having a thousand arms, and named *Abhayāmatya Banāsura,* ruled in *Svarna-giri* (golden mountain), whose daughter named *Usha* dreamt of a very beautiful person. The original being unknown to her, a servant maid named *Chitra reki* was employed to discover the person, who proved to be *Aniruddha,* grandson of *Crishna;* and who, in consequence received an invitation to pay a clandestine visit to the palace; but, being discovered there, *Banāsura* had him seized, and threatened to decapitate him. *Crishna* hearing of the perilous state of his grandson, levied an army, went and fought against *Banāsura,* and cut off his thousand arms. *Banāsura* was a great devotee of *Siva,* who came to his rescue; and the issue was a treaty of peace, with the marriage of *Aniruddha* and *Usha.* Such being the general structure, there is much ornamental filling up, in describing the persons, and perfections of the bride and bridegroom in the usual mode of Hindu poetry.

NOTE.—This paper is entered in Des. Catal., Vol. 1, p. 319, Art. 5.

SECTION 2. *Prabhulinga lila.*

This is a production containing three parts chiefly composed in the *Dvipada* metre by *Soma-deva,* and supposed to be an abridged version of a work in the *pādya-cavyam* containing five sections. *Parvati* being in *Cailasa* inquired of *Siva* if there were any other god besides himself, and he replied there was; to exemplify which statement he assumed an illusive form, and this form, was accompanied by a personification of the *Tāmasa gunam* or bad passion of *Parvati.* The personification of the bad quality of *Parvati,* became enamoured of the illusive form of *Siva;* but all attempts to reach it were unavailing; though the form was followed into wild and desert places, with much personal suffering. At length both illusive form and personification returned to *Cailasa,* and *Parvati* was ashamed of herself on seeing them. An oracular announcement declared that a personification of the *Sātvica-gunam,* or excellent disposition of *Parvati,* alone could attain to communion with the illusive form of *Siva.* The *Satvica* quality in consequence became incarnate, and proceeded to the illusive form, being *Prabhu-linga,* otherwise termed *Allama Prabhu* or *Prabhu-Svāmi,* who was entertained by *Basova,* the minister of the king of *Caliyana.* The said incarnation, on its approach, was mistaken by *Basava* for an incarnate fiend, from the terrific outward appearance. Much matter follows panegyrical of *Allama Prabhu;* and of three or four others named, as associates.

The work is an allegorical attempt at extra panegyric; and may serve to show, that the worst and most ferocious of Hindu sects, the *Jangamas* or *Vira-Saivas*, trace up every thing that is bad to forms of *Siva* and *Parvati*. *Allama-Prabhu* was preceptor to the two *Basavas;* and their proceedings are to be gathered from notices concerning them in other books of the Collection: some of which have been before mentioned.

NOTE.—This paper is entered in Des. Catal., Vol. 1, p. 285, Art. 35.

SECTION 3. *Mairavana-cheritra.*

This paper is a *Telugu* version from the Sanscrit tale. Of that an abstract has already been given: and besides rather a full abstract of the *Telugu* paper is given in the Des. Catalogue, to which it may suffice to refer. There is however an addition in this paper to the tale of the Sanscrit; consisting of matter pertaining to rites, homage, and observances relative to *Hanumàn* the hero of the tale.

NOTE.—The entry in the Catalogue is at p. 329, Art. 36, vol. 1.

GENERAL REMARK.—This Book is in good preservation. There is nothing in it of historical value, save that *Allama Prabhu* was a real person, whose biography is connected with the extermination of the *Jainas* in the N. W. provinces of the Peninsula.

5. Manuscript Book. No. 33. Countermark 323 and 333.

SECTION 1. *Matta-tiruvengala-nātha-charitra.*

This paper consists of two parts, the first is a poetical and encomiastical genealogy of a local chieftain, in the *Padya cavyam* metre; and the other a continuation of the narrative in plainer prose.

The work was written by *Vencatapati*, a Brahman, at the request, and under the patronage of *Tiruvengala-nātha*, a local chief of *Siddhavattam*. According to established usage, the genealogy is deduced downwards from the flood, through *Rama-rāja* of Vijayanagaram; and, in the narrative portion, there is a detail of border strifes with chiefs of neighbouring principalities.

The document is entered in Des. Catal., Vol. 1, p. 309, *two* copies: perhaps designating the two parts.

SECTION 2. *Dhermangada-charitra.*

Apparently a fictitious tale, intended to magnify the virtues of the *Brahmakundā-tir'tha* or sacred pool, at the shrine of *Jaganatha* in *Orissa*. It is the composition of *Narasinhà* a *Vaishnava Brahman*. *Dhermangada* a king of Cashmir, as the fruit of long penance, had in place of a son a *P'hani*, or snake, born to him, by his wife.

The king of *Saurashtra* (or *Saovirashtra*) *desam*, formed a nuptial contract with the reputed *son* of the *Cashmir* king. The daughter of the other king, though distressed at her portion, yet went on pilgrimage with her mate, and at the *Brahma-kunda* pool at *Jaganat'ha* the form of the snake was changed into the human form. Rĕturning to Cashmir, the

marriage was again celebrated ; and *Dhermangada* abdicated his throne in favor of his transformed son-in-law.

An entry occurs in the Des. Catal., Vol. 1, page 324, Art. 20.

Note.—In the leading feature, this seems to me a specimen of the enigmatical language. *P'hani* the hooded snake, is a synonime for *Naga ;* and the people near Cashmir are termed *Nagas* in some documents (see the Mahawanso). The simple import seems to be, that a *barbarian* was invested with the privilege of caste at *Jaganatha-puram.*

Possibly the legend is one taken from the *St'hala-puranam*, as it has the resemblance of such local legends.

General Remark.—This book is written in a large and legible hand with good ink: it is somewhat damaged, by paper-worms ; but, on the whole, may at present be considered to be in moderately good preservation.

6. Manuscript Book. No. 16, C. M. 318.

Nava Chola Cheritra—tale of the nine *Cholas.*

A translation from the Canarese, into *dwi-pada*, Telugu composition, by *Lila Manupa-setti*, and divided into five sections. Some portions of the original Canarese appear to be in the collection. It is altogether a *Jangama* production. The original narrative is ascribed to *Panditar-adhya*, a celebrated teacher of that class. As the *Chola* princes patronized the *Saivas*, they are sectarially numbered among the *Vira Saivas ;* accurate chronology being not considered of consequence. The names of the nine Cholas herein mentioned are *Cari-cala*, *Vicrama*, *Uttunga*, *Ahivara*, *Varadherma*, *Satyendra*, *Vira*, and *Uttama*. The three first, and the two last of these names often occur, both in books and inscriptions ; but the other names are not usual. Stories of distinguished devotees in their respective reigns are given. The whole however seems to be apocryphal.

Remark.—The greater part of the book is clearly written on good paper: a few pages of inferior paper have been attacked by paper-insects; but at present the whole is very legible.

7. Manuscript Book. No. 39, C. M. 729.

This thin volume contains a series of matter divided, in the table of contents, into fifty-four Sections, and relating to not less than 87 villages or *agrahārams*, in various districts of *Telingana.*

The papers are for the greater portion very carelessly, and roughly written, and offer little or nothing claiming a minute abstract. A copy of the table of contents is given in the Des. Catal., Vol. 2, p. 20, Art. 39. But that table in the book, is only another instance of deceptive displays, with very little to repay the trouble of search. As such I pass it by, without minuter notice. It remains in very good preservation. The book is on the same plan with many others labelled "Ceded Districts."

Manuscript Book. No. 61, C. M. 751.

SECTION 1. Account of *Jaganatha*, (together with notice of Orissa princes.)

It is entitled in the document an account of the kings of the *Odriya-désam*. The name of the capital town, in the earliest ages, was *Purushottama-puri* (legendary.) A fane of *Nila Mādhava-svāmi* (or Vishnu) is stated to have received homage from the *Chacraverti* sovereigns, during the *Satya*, *Trēta*, and *Dwāpara* ages. The narrative, in a lower legendary point of view, does not commence till the *Cali* age. The lunar line commencing with *Yuddhisht'hira* is given, as that of persons paying homage here. As the names, herein given, vary from other accounts I wrote them down as follows :

1. Yudhishthira,........	12 Years.		5. Gautama Deva,.....	390 Years.	
2. Paricshittu,..........	757	,,	6. Mahendra Raja,......	315	,,
3. Janamejaya,...........	572	,,	7. Asattu Deva,..........	124	,,
4. Saumara Deva,........	410	,,	8. Satta Saka Deva,.....	150	,,

Satta-saka-deva-raja, coming to *Jaganat'ha-puram*, and finding its buildings gone to decay, had these repaired, and reconstructed. His son named *Vajra-laba-deva-raja* ruled 117 years. In his time the *Turcoman-Moghuls* from *Pāda-pala* country, (the *Patans* from Affghanistan,) invaded the country with an army; but were driven back. After their retreat his son *Sara-sangi-deva-raja* ruled 115 years, in *Delhi*. He had a water reservoir excavated and conquered many princes. His son was *Hamsa-deva-raja* who ruled 122 years. In his days the Turks from Cashmir invaded the country. His son was *Bhoja-raja* who constructed bridges across various rivers, and protected many people. He fought with the *Yavanalu* who came from the *Sindha** country, and took that country. He ruled 127 years. His son *Vira Vicramaditya-raja* ruled 118 years. He had a familiar spirit termed a *Vetala* near to him. He conquered many countries. (Vicramaditya was prior to Bhoji-raja.) It is here noted that the total period of rule of the foregoing thirteen kings is 3,269 years, (average 251½ each.)

Subsequently while *Carnarjita raja* was ruling in *Delhi* in the 65th year of his reign, *Navaranga Pashah Sheikh* came with Turkish (*i. e.* Mahomedan) troops, and drove the said *Carnarjita-raja* away from Delhi. He went to *Purushottami-puri*, and dwelt there. His son was *Vatta-kesvarā-deva*, who ruled 51 years, and fought with many kings. His son was *Tribhuvana-deva-raja*, who ruled 63 years. He first established the use of cowries (or small sea shells) as currency for money. His son was *Nirmala-deva-raja*, who ruled 45 years. He fought with the Ma-

* This may have been an invasion of the Bactrians. Mr. J. Prinsep thought from some medal he made out the name Yavana-Antiochus, and inferred the reign of a Bactrian king in India. It appeared to me to be *Yavana-antaka*, "the conqueror of the *Yavanas*;" and agreeing, if so, with the Manuscript authority.

homedans. His son *Bhima-devu-raja* ruled 37 years; and his son was *Sobana-devu,* who hearing that *Rakta-bahu* (bloody-arm,) a Mahomedan chief, was coming in boats from *Delhi,* with an invading force, was, together with the whole of the people, seized with panic-fear, and fleeing from *Purushottami-puri,* with the image of their tutelary-god, they took it to *Sórna-puram* (golden town) and hid the said image there, in the ground. In that town *Sobana-devu* continued his rule. The Mahomedans came to *Jaganat'ha,* plundered and did mischief; and then returned. The son of *Sòbana* was *Chandra-devu,* who having ruled 4 years in the Jadu-caudam country, formed friendship (or alliance) with the Mahomedans; but they acted treacherously, killed him, and usurped the government, during two years. Afterwards one of the race of *Chandra-deva* ruled 48 years, and another one 96 years. The image of the sacred *Jaganat'ha* was buried under ground 146 years. Thus (from the last total) the *Hindu* kings, and the Mahomedans, ruled in all 396 years.

Kesari Dynasty.

Subsequently the race termed *Kesari* arose. *Yayati Kesari* of *Jaji-puram,* was installed in the *Udriya* country. In the first year of his rule he visited *Jaganat'ha;* and, as there was no image there, he caused the wooden image termed *Dāru* to be dug up out of the earth; and, having it set apart by *pratist'ha,* appointed the usual complement of hierophants and attendants. He ruled 52 years. His son was *Surya Késari-raja,* who ruled 23 years. The race, without connected incident, is then continued in the following series:

3.	Ananta-kesari,	14	Years.		Cali kesari,	22	Years.
	Lalàtta,	,, ...40	,,	15.	Cama	,, ...26	,,
5.	Kanaka	,, ... .24	,,		Kosala	,, ...24	,,
	Nara	,, ...13	,,		Chanda	,, ...21	,,
	Padma	,, ...10	,,		Prachanda	,, ...11	,,
	Vriddha	,, ...15	,,		Druhva	,, ...10	,,
	Vatta	,, ...13	,,	20.	Vijaya	,, ...15	,,
10.	Gaja	,, ...12	,,		Chanda-bala	,, ...18	,,
	Vasanta	,, ... 2	,,		Madhu-sudhana	,, ...17	,,
	Gani	,, ...17	,,		Dherma	,, ... .10	,,
	Bharata	,, ...25	,,		Jaya	,, ...11	,,

25 Nripa-Kesari....15 years.

He was more distinguished. He built the fort named *Barabatti* at the town of Cuttack; and subdued many kings. The line is thus continued:

	Marcadha-kesari,	14	Years.		Kribá-kesari,	10	Years.
	Tripura	,, ...10	,,		Matsya	,, ...20	,,
	Madhava	,, ... 12	,,		Bári	,, ...15	,,
	Govinda	,, ... 10	,,	35.	Sucaja	,, ...13	,,
30.	Nrittya	,, ...16	,,		Jánujit	,, ... 2	,,
	Narasingha	,, ...17	,,				

The total period of time, occupied by thirty-six kings of the *Kesari*-dynasty, was 606 years.

Afterwards one named *Sundangi-raja* came from the South, and formed a new dynasty. He ruled 54 years.

His son was *Gangèsvara-raja* who ruled 25 years. Having no offspring his queen succeeded, and ruled 9 years. His successor was a collateral branch of the same race. *Yegabatti-Cāmadhenu-raja* succeeded, and ruled 7 years. *Mādhava-Cāmadhenu-raja* succeeded, and ruled 5 years. *Ananga-Bhima-devu* in Sal. Sac. 1103 (A. D. 1181,) made some donatives to the fane of *Jagnaat'ha*, and ruled 27 years. *Gaja-raja* ruled 5 years. *Langula-Narasingha-deva-raja* is placed in Sal. Sac. 1136 : and is said to have ruled 12 years. *Cavi-Narasingha-devu-raja* ruled 25 years. *Pratāpa-Narasingha-devu-raja* ruled 20 years. *Cavi Cānda-Narasingha-devu-raja* ruled 2 years. *Cotala-Narasingha-devu-raja* ruled one year. *Sangha-bānu-Narasingha-devu-raja* ruled 7 years. From *Sundangi-raja* down to the last mentioned there were 13 rulers, who governed during 205 years.

The mention of a few other names, without any incident attached, introduces the mention of the irruption of the Mahomedans, who scoured the country, plundered, burnt, and levied tribute ; after doing which they retired. Subsequently the name of *Purushottama-devu* appears with some distinction. Soon afterwards more serious struggles with the Mahomedans began. At length the Mahomedans got possession of the fane of *Jaganat'ha*, and burned the images contained therein. A *Brahman* performed the ceremony of *Pratishta* over other images, in place of those that had been so destroyed. But the document states that henceforward the country went to decay and ruin. It finally became a Mahomedan province ; and then the Mahomedan officers, finding the tax on the fane of *Jaganat'ha* might be made profitable to the revenue, as a measure of political policy they brought the images into celebrity.

Remarks.—This was done by providing superb appointments, and promoting the influx of Pilgrims. By this means a shrine, not more distinguished than many others, was brought into disgraceful prominence and culpable notoriety.

This Manuscript is of some importance ; and I should think might merit full translation.

It is followed by another document, in the Sanscrit language, and Telugu character ; which, from a comparatively cursory examination, was found to contain the same matter as the Telugu one ; so as to leave the inference that the Telugu document is a translation. In the table of contents it is marked as a second section ; and stated to contain " a genealogy of the kings of *Wodradesam*" which, it may be observed, would be

a better title to the 1st Section, than that given to it, as an "account of *Jaganat'ham.*"

NOTE.—The ink is good; the country paper thin; but the whole, down to the time of its examination by me, had continued in remarkably good preservation.

Manuscript Book. No. 6, C. M. 313, 394, 337.

SECTION 1. *Jangama Calijnanam.*

This is an account put into the form of a prophecy as if delivered by *Sarvajna*, stating that *Vijāla-rayer* was to turn traitor to *Siva*, and would be killed by the *Basavas;* who, as a reward, would attain the beatification of *Siva's* world: and thenceforward proceeding, after the mention of a few unimportant events, to the history of the *Rayer* dynasty, and noticing other kingdoms, more cursorily in connexion therewith.

A supplement is added, as if delivered by *Vara-paiyar* to *Anātaiyar*, noticing some events subsequent to *Sālivāhana;* but dwelling chiefly on the incidents of the *Vijayanagara* kingdom. These things are not new, after the preceding investigations, but they are not without intrinsic interest.

SECTION 2. *Ramastava-rājam.*

The commencement of a mystical work, as if related by *Suta* to *Savunaca* in the *Naimisara-vanam.* There is only the first *adhyāya*, or Section. This relates to various kinds of *Yogas*, or modes of ascetical, ritual, ceremonial, and mental reflection. It is of course imperfect.

SECTION 3. *Vāsava Canyaca-Cheritra.*

This paper, which relates to the *Cômti* class, commences with an account of the origin of the *Vaisya* caste, from the thighs of *Brahma.* The principal subject is the self-immulation of 101 families of this caste at *Pennaconda;* because *Vishnu-Verddhana*, the king of that place, sought the daughter of a merchant named *Casuma-Chetty* in marriage; and the whole tribe preferred death to compliance. A complaint was then preferred in *Siva's* paradise, that there were no longer any of the *Vaisya* caste on earth. As their souls were in *Siva's* heaven, he commanded them to go back again to earth, that the world might not remain without the *Vaisya* class; which order was accomplished. In other words the original order of *Vaisyas* having become extinct, a spurious order arose in their place.

REMARK.—This book remains in good preservation; and the contents are of average interest.

Manuscript, without cover, label, or number except the mark (× 101.)

On examination this document proved to be part of the *Naishadha*, or romance of *Nala* and *Damiyanti*, founded on an episode of the *Bhāratam.* There are eight *asvāsas* or sections, perfect, with portions of others, at

the beginning and end, imperfect. Of this tale copies are extremely common: this fragment, in consequence, is without value.

With the exception of TELUGU statistical documents, containing replies by Natives to a series of inquiries by Colonel Mackenzie, all formed on the same plan, and labelled "Ceded Districts," the above concludes the examination of Manuscript Telugu papers in the collection, and the analysis of them made by me in 1837-39. Inclusive of the Palm-leaf Manuscripts preceding, the whole of the Telugu works, on Native Literature or Mythology, have been now reported.

A few Mahratta, and some Canarese, documents, together with the above statistical papers, remain. Abstracts are in my possession.

MADRAS,
December 14*th*, 1848. W. TAYLOR.

VIII.—*Report of the Committee of the Agri-Horticultural Society of Madras, for the year* 1848. *Communicated by* Major REID, C. B., *Secretary of the Society.*

It will be observed that although the balance sheet shows a very fair sum in favor of the Society, it is Rupees 957 less than that of the 1st January, 1848. It becomes necessary, therefore, to show what has occasioned so large an expenditure above the receipts, and what has been its result to the garden and the Society. In the first place then as to expenditure.

In 1847, the Society determined on erecting a conservatory at the lower end of the garden, at an estimate of Rupees 740-15-8. The building was erected accordingly, but its cost was not entirely brought on the books until after the completion of the balance sheet of 1st January, 1848, since which date the sum of Rupees 231-6-3 has been debited.

In June last, the large conservatory was entirely re-roofed at Rupees 95.

In September last, the Superintendent's house underwent a thorough repair and had some addition made to it in regard to comfort at Rupees 154.

In October an entire new set of gardening tools, wheel-barrows, &c. were provided, and about the same time a very complete set of instruments for pruning, lopping, budding, &c. &c., were purchased. The expense incurred for these various items stands as follows:

	Rs.
A pair of Bullocks, - - - - - -	50
Excavating a tank, - - - -	91
Balance of new conservatory, - - -	231
Re-roofing the old do. - - -	95
New gardener's tools, - - - - - -	88

	Rs.
Box of pruning instruments with patent grindstone,	75
Repairs of Superintendent's house, -	154

Making a total of Rupees 784—for expenses beyond the usual disbursements; to which must be added the sum of Rupees 294-4, paid in March for seed bill of 1847,—and which ought properly to have been paid before the balance sheet of 1st January, 1848, was made out, so that the total of extra expenses for the year is Rupees 1,078.

It will be observed that the several items of expenditure, enumerated above, are not in themselves, with the exception of the new conservatory, such as add any very apparent benefit to the garden or the Society, but have become absolutely requisite from wear and tear, and it may not be unappropriate here to remark, that the Society are much indebted to their late Secretary Captain Worster for his judicious management of their Funds, which has thus enabled them to meet with ease all these necessary periodical expenses.

Besides the above a sum of Rupees 218-12-11 has been expended in beautifying and embellishing the grounds, but as this is a work which will be continually carried on, in a greater or less degree, this expenditure can only, at present, be classed under the head of "ordinary."

There is one item more of expenditure to be noticed, and that is the sum of Rupees 214, which was paid to Mr. Charpin for plants, bulbs, &c. It is a matter of regret that this speculation has by no means answered our expectations, in the way of enriching our garden. At the time of purchase the plants were destitute of leaves, and we were obliged to trust to Mr. Charpin for their description, which has in nine cases out of ten turned out to be fictitious. In the one item of roses—though declared to be of many different varieties—the whole of them have proved to be from the same stock; so that, out of the whole of the plants purchased, we have only added about 20 new species to the garden, besides some handsome dahlias and bulbs of sorts.

RECEIPTS.

On 1st January, 1848, the number of Subscribers were........	110
Left India during the year,...........................	8
Withdrawn,..	9
Elected during the year,..................................	11
Present number............	104

Of these, 89 may be considered as making regular payments, which, at the rate of 28 Rupees each annually, amounts to Rupees 2,492, or, on an average, Rupees 207 per month; add to this Rupees 150 monthly from Government, and we have total average of monthly

Gratuitous receipts......................................	Rups.	357
Average sale of seeds, plants, &c., to non-subscribers,........	,,	46
	Total..	403

		Rs.	A.	P.
	To meet pay of Superintendent, and all servants,	183	8	0
*	Average ordinary expenses, ...	40	0	0
	Do. extra do.	50	0	0
	Total..	273	8	0

*Includes keep of 6 Bullocks, wear and tear of machinery of the draw well, cost of flower and water pots.

Leaves, in favor of the Society, a monthly average of Rupees 120. All seed bills for the current year have been paid, so that the present state of the Society stands thus on 1st January:

Cash in hand, ...	Rups.	745	4	0
Due arrears of Subscription, ...	,,	1,266	0	0
Due seed and other bills, ...	,,	117	14	0
Total Rupees..		2,129	2	0

At a Meeting of the Members of the Society on the 16th June last, it was resolved to give up, for the future, the cultivation of vegetables in the garden; as the object of having done so for so many years, had been, so far as the Society was concerned, fully accomplished; in that it had taught the Natives our mode of culture, and the superiority of our vegetables, if not to their taste as esculents, certainly as a marketable commodity amongst the European and Indo-British community. As an encouragement to cultivators of European vegetables, the Society, however, still continue to award pecuniary prizes to market gardeners exhibiting the best produce at their annual meeting. One of the original intentions of the Society was the introduction into their garden, and thence the gradual distribution, of trees and shrubs, whether valuable as fruit bearing, timber, or for other qualities, or simply ornamental; and in thus giving up further cultivation for culinary purposes (which indeed required very great labor, care, and attention) the Society is enabled to turn the whole of its resources into the former channel, and thereby, it is hoped, in a short time, not only to stock its Garden with a larger and more varied assortment of fruit and other trees and shrubs, but to establish a better system of nursery gardening in all its branches, including also the collection of the seeds of all tropical plants, for distribution in India, or for transmission to Europe. The Secretary would beg here to observe, that it is very desirable this latter arrangement should be more generally known, and that Subscribers can at all times procure packets of Indian seeds carefully packed and labelled for transmission to Europe, or elsewhere—on application being made to him—with directions for the despatch; a charge only being made for packing (if in tin), or expense of carriage if paid here.

The Secretary has great pleasure in reporting that the new conservatory has proved of infinite service, during both the hot season and the rains; in the former, by means of grass tatties, the temperature was greatly reduced, and by keeping the whole of the inside constantly sprinkled and syringed with water, the injurious effects of our scorching

land-winds were less felt by our exotics, and less hardy plants, than in any other previous season. We were enabled, moreover, to propagate by cuttings in sand at a much earlier season than hitherto.

Kindly sent by
1 Dr. White.
2 Captain Neill.
3 Mr. Rodrigues.
Those from Nagary by our own collector.

During the year we have received Orchids of various descriptions from Coimbatore,[1] the Nagary Jungles, Ramanmully Hills,[2] and a few from the Shervaroy Hills.[3] With very few exceptions these have all thriven well, and their preservation is mainly attributable to the shelter and moistened atmosphere of the conservatory; as although, on several previous occasions, attempts have been made in this particular line of floriculture, a total failure has invariably been the result.

In the distribution of fruit and other trees and shrubs, the last 6 months only records a list of 1,800 which have left the garden, and we have been able to propagate by seeds, layers, ghooty grafts, cuttings, &c., many thousands of young plants, now in a thriving state, for next season's supply. Among others we have at least 2,000 of young plants of the American sumach (Cæsalpinia, Coraria or Dividivi.) It is much to be regretted that greater efforts are not made to produce this drug for exportation considering its invaluable properties as a tannin. In Dr. Wallich's report on it in 1845, he says "the American sumach deserves to be extensively cultivated in this country. It seems to thrive remarkably well, requiring very little, if any care, except in its youngest state and a proportionally small expenditure of money. The tree seems to be contented with a very ordinary sort of soil, and in all probability, when once reared from seeds ripened in the country, it will be as productive as in its own native climate; or at least sufficiently productive to make the cultivation of the tree an object of importance."

Now, there is no doubt of its productiveness, and the fact of its growing so luxuriantly in the Society's garden is a decided proof of its not requiring good soil; for nothing can be worse, naturally, than that of the garden, which (except in rainy weather, when in spots not drained it becomes a quagmire) is one indurated mass of clay and sand.

The garden suffered greatly in 1846 from most destructive storms, and fully 200 fruit trees perished, among others some very valuable mangoes; many of these have been replaced by young grafts, and stocks, to the extent of upwards of 700, will be ready for grafting next year.

The demand for Mauritius Sugar Cane has almost ceased, abundance being now grown almost in every part of the Peninsula. There is still however, a small stock on hand, and which will, for the present, be kept up.

Some valuable timber trees have been introduced into the garden, such as those yielding the Chittagong wood, the Andaman red wood, and Mahogany. Of this last (Swietenia Mahogani) most valuable timber tree it is very gratifying to be able to report, that out of those raised in the garden from seed received from Calcutta in 1836, none have died, and

they are thriving so luxuriantly that some of them have attained the height of 18 feet.

The Sissoo, which was introduced some 4 or 5 years back, has now become quite common throughout the country, so much so indeed that in the Salem districts above the ghauts, it may now be occasionally met with on the road side, having commenced to take its place in those beautiful avenues, the unremitting care of which, as well as of the roads, has always done such credit to the authorities in that district.

It remains but to remark on the additional attraction of visitors to the Society's garden since the Right Honorable the Governor has kindly permitted the attendance of the band on Friday evenings, and on the kindness of those gentlemen and ladies who have contributed to defray the travelling expenses of the musicians from the Fort.

The garden is at all times open for all classes that may wish to visit it, with the single provision that they will be good enough to refrain from gathering any of its produce.

The Secretary, at the same time, laid before the Meeting specimens of a vegetable green received by him with the following letter from Monsieur Froment, of Pondicherry.

MONSIEUR,

" Après bien des recherches constantes et beaucoup de persêverance je crois avoir trouvé le moyen de fabriquer le vert végétal avec les feuilles d'une plante que l' on trouve dans l' Inde; sa manipulation, facile, plus facile, que celle de la feuille d' indigo peut me permettre d'enformer des pains en moins d' une heure, a l' aide de moyen peu coûteux, et á tres peu des frais. Si Messieurs les membres de la Societé dont vous êtes le secretaire pouvoient penser que cette decouverte merite quelqu' encouragement, je serais heureux de pouvoir être autorisé, a leur soumettre mes produits, et sur leur examen préalable du morceau que je vous envoie. J'attendrais la determination qui aura prise, ou pour m' abstenir de toutes nouvelles démarches, ou pour proposer moyennant une recompense pour la decouverte, le secret que je dois considerer comme ma propriété.

J'ai l' honneur de vous addresser par le banghy un morceau des produits que j'obtiens pour être soumis à l'examen de la Societé a la quelle vous appartenez.

J'ai l'honneur, &c. &c.
ALE. FROMENT.

Major F. A. REID, C. B.
Secretary Agri-Horticultural Society.

PONDICHERRY,
18*th Nov.* 1848.

Major Reid observed that he had submitted the specimen to Professor Key, who stated his opinion that this "vert vegetal" was really a vegetable substance, that he could detect none of the sources of mineral colours in it. Moreover, it burns away, leaving a light whitish ash; so that it would appear impossible that the *coloring* matter of it can be mineral.

IX.—*Meteorological Observations made at the Madras Magnetic Observatory from January to June, 1848.*

	Mean monthly indications of the barometer at the times of superior maximum and minimum pressure corrected to 32° 0. 1			Mean monthly temperature, as deduced from the hourly observations, together with the mean monthly maximum and minimum temperature. 2			Depth to which rain has fallen, and amount of water evaporated from a shallow cistern of water, together with the relative humidity of the air. 3			Direction of the wind in each month, as exhibited by the number of hours during which it has blown from the N.W. S.W. S.E. or N.E. 4				Mean and extreme pressure of the wind as shown on a square foot of surface. 5		Mean per centage of clouds covering the face of the sky during the day and night in each month. 6		Mean monthly tension of vapour calculated by the monthly means of dry and wet thermometer at 30 inches barometer standard. 7
	Max. h. m. 21·41 P. M.	Min. h. m. 3·41 P. M.	Difference.	Mean.	Max.	Min.	Rain.	Evaporation.	Quantity of moisture or humidity.	N.W.	S.W.	S.E.	N.E.	Mean.	Extreme	Day.	Night	
	Ins.	Ins.	Ins.	°	°	°	Ins.	Ins.		No.	No.	No.	No.	lbs.	lbs.	Cents	Cents	Inches.
January,.........	30·060	29·944	·114	74·8	82·4	67·1	0	10·168	·74	101	24	116	503	0·11	0·97	0·19	0·11	·625
February,.........	·047	·932	·115	78·1	86·2	69·2	0	10·866	·72	78	70	155	393	0·14	1·42	·18	·13	·689
March,.........	29·948	·819	·129	81·9	90·2	73·0	0	11·126	·75	27	246	470	1	0·31	2·30	·22	·14	·792
April,...........	·853	·733	·120	86·4	95·2	78·0	6·377	11·528	·75	39	224	430	27	0·41	2·85	·33	·29	·909
May,............	·787	·667	·120	88·8	98·7	80·4	·100	12·291	·66	44	250	448	2	0·54	2·67	.35	·20	·869
June,............	·751	·621	·130	90·4	102·5	81·1	1·877	15·412	·54	132	392	86	10	0·48	2·75	·57	·63	·745

MADRAS OBSERVATORY,
July 1st, 1848.

Meteorological Observations, made at the Madras Magnetic Observatory, from July to December, 1848.

	Mean monthly indications of the barometer, at the times of superior maximum and minimum pressure, corrected to 32° 0. 1			Mean monthly temperature, as deduced from the hourly observations, together with the mean monthly maximum, and minimum temperature. 2			Depth to which rain has fallen, & amount of water evaporated from a shallow cistern of water, together with the relative humidity of the air. 3			Direction of the wind in each month, as exhibited by the number of hours during which it has blown from the N.W. S.W. S.E. or N.E. 4				Mean and extreme pressure of the wind, as shown on a square foot of surface. 5		Mean percentage of clouds covering the face of the sky during the day and night in each month. 6		Mean monthly tension of vapour calculated by the monthly means of dry and wet thermometer, at 30 inches barometer standard. 7
	Max. h. m. 21·41 P. M.	Min. h. m. 3.41 P. M.	Difference.	Mean.	Max.	Min.	Rain.	Evaporation.	Quantity of moisture or humidity.	N.W.	S.W.	S. E.	N.E.	Mean.	Extreme	Day.	Night	Inches.
	Ins.	Ins.	Ins.	°	°	°	Ins.	Ins.	Cents.	No.	No.	No.	No.	lbs.	lbs.	Cents	Cents	Inches.
July,........	29·770	29·660	0·110	87·3	97·7	78·8	3·869	11·235	·64	223	378	127	16	0·35	3·25	·70	·60	0·800
August,........	·793	·675	·118	86·3	96·2	78·7	5·126	10·646	·66	208	400	127	9	·30	1·57	·70	·75	·811
September,.......	·833	·710	·123	85·0	93·5	78·8	3·092	9·654	·73	230	303	135	52	·18	2·05	·62	·57	·854
October,........	·875	·754	·121	82·8	90·5	73·6	13·933	7·954	·78	264	213	94	173	·18	2·85	·60	·55	·850
November,.......	·978	·876	·102	78·8	84·2	74·7	17·285	5·333	·84	222	33	67	398	·37	6·70	·72	·65	·808
December,.......	30·024	·913	·111	77·3	83·2	72·0	3·112	6·318	·77	156	12	66	510	·16	2·05	·42	·35	·712

MADRAS OBSERVATORY,
1st *January*, 1849.

NIGHT.

BY THE LATE REV. THOMAS HALLS, A. B.

Laté per agros, plena silentio,
Nox alta regnat; roribus humidi
Campi recumbunt, et viretum
Omne latet tenebris amictum.
Cælum nigrescens nube, reconditur,
Nec sidus unum per vacuum micat,
Lassum viatorem quod igni
Lætificet tremuloque vultu.
Singultit ægro mitis anhelitu
Nereus, et undæ pectore fluctuant,
Suoque pacatæ quiescunt
Murmure dulcisono per oras.
Sopore blando compositus jacet
Fesso colonus cum bove, totaque
Natura, finito labore
Nocte tacet placidâ sepulta;
Ni quà latratu rus vigili canis
Obliviosum suscitet, aut moras
Undâ lapillorum loquaci
Transiliat tremebundus amnis;
Vel inter arbusta et silüæ comas
Singultientes ludat, anhelitu
Languente suspirans amorem
Dulce tibi, Philomela, ventus.

Translation of the above by G. W. MAHON.

'Tis night!—and, widely brooding o'er the plains,
Darkness, deep-felt, in solemn silence reigns!
The dewy fields and shadowy groves retire,
Enwrapt in gloom:—above, no starry fire
Glimmers, from forth the mirky sky, to cheer
With its faint smile the way-worn traveller.
With soothing sighs, the waving, heaving deep,
Lull'd by its own sweet murmurs, sinks to sleep.
Their labor o'er, the clown and herd are blent
In one deep dream, oblivion's blandishment!
Buried in night, all nature, hush'd, is still:
Save where the watch-dog's bark, with noisy thrill,
Startles the dreamer; or, with babbling waves,
The village brooklet tremulously laves
The opposing pebbles, and their barriers leaps;—
Or, where the sighing Zephyr, sportive, creeps,
Whispering, with panting heart, from tree to tree,
Sweet Philomel, his tale of love to thee.

XI.—NOTICES.

On the Prices of Indian Grains.

Prices of the Cerealia and other Edibles of India and England compared. By Colonel Sykes, Vice-President of the Royal Society, Read at the Meeting of the British Association on the 29th June, 1847. The author's chief object was to show that India, in cases of dearth in England, could be looked to with confidence for a supply of bread stuffs—and India having the advantage of its principal crops ripening in January and February, the moment a failure of the crop should be known in England in August, orders for supplies from the following January crops of India could be sent, and the supplies landed in England, even by the route of the Cape of Good Hope, two or three months before the ripening of the crops in England. Colonel Sykes furnished averaged prices for years from various parts of India; but he enumerates very many grains, cheap, nutritive, and in general consumption, which do not appear in the price lists, and whose names even are unknown in Europe, except to the learned. The first price list gives an average from 1827 to 1845, at seven markets in the Deccan, under the Bombay Presidency. The ultimate result is shown in the following table.

	Avoirdupois weight of Grain for 2 *s.*		Price per quarter English.	
	lbs.	oz.	*s.*	*d.*
Wheat,	64	5	14	11
Rice,	36	13	$\frac{7}{10}$ *d.* per lb.	
Grain,	60	5	15	11
Bajra,	82	10	11	7
Jowaree,	100	8	9	6

Now these 100 lbs. weight of jowaree for two shillings, are sufficient for the support of a man for two months at the least. But in 1828 and 1843, at the market of Kullus, the average price of jowaree was 204 lbs. for two shillings, or more than 2lbs. for a farthing; so that in those years a man could live for less than a farthing per diem for meat. Colonel Sykes gives various other tables of prices at fifty-three military stations in Bengal, in Goojost, &c.—particularly

one from the Saugor and Nerbudda territories from 1831 to 1840, and from 1843 to 1846. In 1843 wheat sold at 167 lbs. avoirdupois for two shillings ; and at seven markets enumerated, the price per quarter English varied only from five shillings and six pence, to six shillings and eight pence. The Bengal tables, independently of the bread stuffs, gave the prices of beef, mutton, fowls, salt, sugar, &c. From these it appeared that at some places a bullock could be bought for ten shillings, a sheep for one shilling, and twenty fowls for two shillings. Salt varied exceedingly in price, from $5\frac{3}{4}$ lbs. for two shillings at Calcutta, to $49\frac{1}{7}$ lbs. at Cuttack, the averages being 20 lbs. 9 oz. for two shillings. The Government sold the monopoly salt at from $20\frac{1}{2}$ lbs. to 25lbs. for two shillings; and a curious fact was elicited from the tables, that out of the limits of Bengal proper and beyond Allahabad, the retail price of salt was lower than the *wholesale* Government price ; the wholesale price of Cuttack salt being $20\frac{1}{2}$ lbs. and the retail price out of Bengal proper $23\frac{4}{7}$ lbs. showing that there must be sources of supply independent of the Government monopoly salt. At a labourer's wages of six shillings per mensem, a third of a month's wages would supply him with a sufficiency of salt at the different stations, varying from three months in Calcutta to thirty-five months at Kheir, in the Deccan, and forty-five months in Bombay. The following table exhibits the final results.

	Wheat.		Rice.		Grain.		Flour lbs. for 2s.	Peas or Dhall.		Jowaree Bajra.				Sugar per Cwt.	Salt per Cwt.
	lbs. for 2s.	Per Quarter.	lbs. for 2s.	Per Cwt.	lbs. for 2s.	Per Quarter.		lbs. for 2s.	Per Quarter.	lbs. for 2s.	Per Quarter.	lbs. for 2s.	Per Quarter.		
		s.		s.		s. d.							s. d.		
London, Nov. 16th, 1846,	17	57/	$10\frac{4}{22}$	22/	0	0	11	19	52/	0	0	0	0	53 to 50 / 49 to 45	0
Do. June 1st, 1847,	9·4	102/	9·1	24/6	0	0	0	0	68/10	0	0	0	0	0	0
Do. June 18th, 1847,	$10\frac{1}{2}$	92/2	6·6 to 1·09	34 to 20/6	0	0	0	0	0	0	0	0	0	0	1/9 to 2/4$\frac{1}{2}$
Bengal, 1845 and 1846,	$57\frac{1}{2}$	16/8	25 to 45	5/ to 9/	$65\frac{5}{7}$	14/7	31	$40\frac{1}{2}$	23/6	0	0	0	0	0	9/ to 10/11
Deccan, Averages of years..............	$64\frac{1}{2}$	14/11	$36\frac{3}{4}$	6/2$\frac{1}{4}$	$60\frac{1}{2}$	15/11	0	0	0	$100\frac{1}{2}$	9/6	$82\frac{10}{16}$	11/7	0	3/1
Saugor, do.	143 to 174	5/6 to 7·6$\frac{3}{4}$	34 to 76	2/11 to 6/5	77 to $23\frac{1}{4}$	4/1 to 12/5	0	0	0	0	0	0	0	0	0
Nagpoor, do.	$60\frac{4}{7}$ to 113	8/6 to 15/10	$35\frac{1}{2}$ to 66	3/4 to 6/4	$73\frac{2}{7}$	13/1	0	60	12/2	0	8/	0	12·7	0	9—1$\frac{3}{4}$
Goozrat, do.	$23\frac{1}{4}$ to 73	13/2 to 40/	$28\frac{5}{7}$ to 71	3/2 to 7/9	$22\frac{4}{7}$ to $51\frac{3}{7}$	17/7 to 42/6	0	0	0	0	0	0	0	0	0
Hoshingabad, do. . . .	40 to 192	5 to 23/10	35 to 68	3/3$\frac{1}{2}$ to 6/5	65 to 269	3/7 to 14/9	0	0	0	0	0	0	0	0	0
Bombay, July, 1845....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2/5$\frac{1}{4}$
London, 1836 to 1847...	0	0	0	0	0	0	$18\frac{2}{34}$ to 10	0	0	0	0	0	0	0	0

The prices in Goozrat are those of a year of great scarcity—1846.

Report of Brit. Association.

Health of Troops in India.

Colonel Sykes read a paper, contributed by E. Balfour, Esq., comprising his observations "On the means of maintaining the health of Troops in India." It commenced by stating, contrary to the opinion of Colonel Sykes, that no sufficient data were given in a pamphlet published by the latter to support the idea that "habits of life" or "the quantity of spirits consumed" by the army in India are the chief cause of disease. Intemperance would be found to add but a very small proportion to the deaths from climaterial diseases, which were known to continue in spite of the most regular and temperate habits. There seemed to be an unjust impression abroad that a soldier was a very intemperate character; but it would be found that other classes of our countrymen did not enjoy a greater immunity from disease. What was the proportion of deaths amongst the highly temperate civilians of India, who were the most intelligent, best clad, best paid, best lodged and most independent servants of the Indian Government? Although the mortality amongst the same class in England from 1801 to 1832, averaged only 9·1 per 1000 annually, according to the accounts of the Equitable Insurance Society, yet Mr. H. T. Prinsep informed them that in the twenty years from 1809 to 1828 inclusive, the Madras Civilians lost 23·8 per 1000, of their strength, the Bengal Civilians 25·1 per 1000, and the Bombay Civilians 31·7 per 1000. Tables were read to show that the human race enjoyed better health in their own than in any foreign country, whatever may be their rank, duties, or comforts. The paper concluded by observing that some deaths may, no doubt, be attributed to the nature and duties required by a military life, yet in most cases they are attributable to the climate of the locality in which soldiers serve.—*Ibid.*

On Atmospheric Disturbances throughout the world, and on a remarkable Storm at Bombay, on the 5th of April, 1848. *By Colonel Sykes.*

This communication, which partook more of the nature of an elaborate report than of that of a notice, characterizes the atmospheric disturbances and anomalies, which presented themselves in various places in Europe, Asia, Africa, and even America, for some months past, as not less remarkable than the political agitations and

storms which swept over Europe lately. Of these it gives ample details collected from various sources. It particularizes the ice and snow in Poonah, and the extreme cold at Bombay, Simla and other places in the East Indies, as quite a miracle. It traces the contemporaneous state of public health; and concludes by giving, as described by Dr. Buist in the *Bombay Times*, all the remarkable details of an extraordinary thunder storm; with the meteorological records preceding, accompanying, and following it, the progress of the storm from place to place, influence on magnetic phenomena, and auroral displays. Dr. Buist on the subject observes,—" Our gales of the 7th April, 27th May, 7th and 19th October, have all been traced to or from the other side of India, travelling very regularly across at the rate of 20 miles an hour. The dust storm of Sunday se'nnight noticed in our paper of Wednesday, was merely, it seems, a portion of the Madras gale of the preceding Wednesday,—the fall of the barometer which occurred here on Saturday the 4th, corresponding with that which occurred on the Coromandel coast on Wednesday the 1st,—the storm following in both cases the day subsequent to this."—*Ibid.*

Minerals of Ceylon.

The Members of the Asiatic Society of Ceylon held their usual Monthly Meeting on Monday last, at the residence of J. E. Middleton, Esq., the appointed subject for conversation being " The useful ores and earths of Ceylon."

Specimens of Iron ore of various qualities and in various states of combination, of Tin ore, Chrome, Nickel, Cobalt, and Kaolin of several degrees of purity, as well as of smelted Iron were laid upon the table, as being the chief of what were considered by Dr. Gygax as capable of being worked to advantage for commercial purposes.

A paper by the collector of these substances was then read, from which we gathered that the *Cobalt* found in Saffragam was of excellent quality, and as this mineral forms the base of a very valuable coloring matter in great request for porcelain manufactures both in Europe and in China, there appears very good reason to believe that the article might be turned to profitable account. Its value in the German markets is from £80 to £100 the ton. *Nickel* is found *abundantly* at Madampe, and elsewhere in the same district, and is also worthy of attention, as it is now in extensive use in the manu-

facture of German silver ware. The quality of the samples obtained, was stated by the Dr. to be very good.

Tin, although not yet found in any extensive strata, is believed most confidently to exist along the southern mountain range of Ceylon, but to explore the favourable localities would be a work involving considerable outlay and labour. The commercial value of the metal is too well known to require comment; that from Banka realizes from £80 to £90 per ton, in the European markets.

Chrome ore is found abundantly and of good quality as a Chromite of Iron, at Haterabage and Balangodde.

Iron Ore. Some excellent specimens of the Peroxide of Iron were exhibited: these are the most useful and valuable ores of the country, and is no where richer than in Saffragam. An analysis had given the following result:—

Peroxide of Iron	8,200
Peroxide of Manganese	900
Molybdena	250
Silica	550
Alumina	100
	10,000

These proportions will occasionally vary, but not so as to impair the actual value of the Metal. It was the opinion of several practical persons that the metal obtained from this ore was not to be surpassed in the world, and equalled only by some of the finest Swedish Iron. The very simplicity of the means by which the Singhalese smelters obtain 50 or 60 per cent. of the pure metal from the rough ore, and the ease with which it is worked into steel, bespeaks its real value. It is believed that it could be laid down in Colombo at 6*s*. or 7*s*. per cwt. of the finest quality. Attempts had been made in a small way to bring the ore down to a smelting establishment in Colombo, but obstacles had arisen from the apathy and prejudice of the native headmen, and nothing had been done. The Iron-glance, Magnetic Iron Ore, and Bog Iron Ore, were not of any real value. The latter is most abundant however.

Kaolin.—This substance appears to have been hitherto applied to no practical purpose save those of white-washing walls and forming water goblets of the roughest description. Some earth had been sent home and pottery made from it, which was produced. There can be little doubt from these specimens, that good use might be made of the earth in the island for tiles for houses and similar purposes.

The bad quality of the paving and roofing tiles made in the present day in Ceylon for ordinary use, is too well known to call for much comment : the inferiority also of every description of earthen vessel for domestic use is not less notorious. To effect some improvement in the manufacture need not be a very difficult task, and with the Kaolin so easily obtained, so good in texture, and to be found in such large quantities, we have a ready means of producing the finest description of tiles for the floors of houses, and the better qualities of kitchen pottery.

It was determined that information should be obtained as to the native mode of working Pottery, and if possible some experiments be made with the Kaolin.

Some specimens of native flax were exhibited, of a very superior strength and considerable firmness, concerning which it was arranged information should be sought. A member also produced a cloth on which was painted the copy of an ancient inscription to be found on a rock temple near Dambool, sent for the purpose of being deciphered by the Government Agent of the Central Province. The letters to be in Elu.—*Ceylon Examiner*, *Jan.* 24, 1849.

XII.—Proceedings of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

At a Meeting of the Managing Committee, held at the Club House, on Tuesday, the 5th January, 1847.

Read the following letter from the Deputy Secretary to Government, dated 11th December, 1846.

Fort St. George, 11*th December*, 1846.
No. 1095.

Gentlemen,

Public Department.

Para. 1.—I am directed to acknowledge the receipt of your Officiating Secretary's letter of the 16th ultimo, and to convey to you the thanks of Government for the offer of the Society's Museum, which they are willing to accept, on the terms proposed. With regard to its location, arrangements will hereafter be made for depositing the Museum where it can be most advantageously placed.

2. Adverting to the 6th para. of the letter under acknowledgment, I am instructed to observe that it is apparently the desire of the Honorable the Court of Directors, that the proposed central Museum should

not be one exclusively of Economic Geology but that it should combine many subjects of interest, and it will be the object of this Government to afford every facility for rendering the Institution as extensively useful as possible.

I have the honor to be, &c. &c.
(Signed) R. G. Clarke,
Depy. Secy. to Government.

I. *Resolved,*—That this letter be recorded, and laid before the Subscribers at the approaching Annual General Meeting.

Read letter from the Officiating Secretary to the Madras University, dated 16th December, 1846, acknowledging receipt of letter from the Officiating Secretary Madras Literary Society and Auxiliary of the Royal Asiatic Society, dated 24th November, 1846, and forwarding, for the information of the Managing Committee, copy of a letter recently addressed to Government by the President of the Madras University, conveying the opinion of the President and Governors of that Institution, on certain points connected with the proposed establishment of a central Museum of Economic Geology at Madras.

II. *Resolved,*—That this letter be recorded.

Read the following letter from T. S. Smith, Esq., dated 29th December, 1846.

Madras, *December 29th,* 1846.

To

The Secretary to the Literary Society.

Sir,

I saw a few days ago at Monsieur Deschamp's on the Mount Road, a set of Books which I think would be a very desirable addition to the Stock Books of the Library; and as I am told it is for sale, and the price seems reasonable, I request you will be good enough to bring it to the notice of the Committee. The work is the "Theatre Français de Scribe" in 20 volumes, whole bound, and very well illustrated, and the price set upon it is eighty Rupees.

I have the honor to be, &c. &c.
(Signed) Thos. Sydney Smith.

III. The Committee having examined two volumes of the work in question which had been forwarded for their inspection, are of opinion that the price put upon it is much too high, and that, even if it was procurable on more reasonable terms, it would be inexpedient to purchase an expensive foreign work, until the accounts for the past year are made up, and the state of the Society's Funds ascertained.

The Officiating Secretary lays before the Meeting two letters from Messrs. W. H. Allen and Co., dated 19th October, and 19th November, 1846, submitting an explanation respecting the supposed incompleteness

of the copy of the Encyclopedia Metropolitana furnished by them to the Society, and advising the despatch of books and periodicals per steamer. The Committee observe that the misapprehension regarding the Encyclopedia Metropolitana has been already rectified, and that the books and periodicals in question have been duly received.

V. *Resolved*,—At the suggestion of the Rev. G. Knox, that a copy of the *Madras Christian Instructor*, be ordered for the use of the Society.

VI. *Resolved*,—At the suggestion of Major Anstruther, that a list be prepared of standard English works not at present contained in the Society's Library, with a view to their being obtained, either at once or by instalments, whenever the funds of the Society may appear sufficient to meet the expense without interfering with the usual supplies of new books and periodicals for the use of Subscribers. At the request of the Committee, Major Anstruther, the Rev. Mr. Knox, and Mr. Williamson undertake to prepare the list in question.

As it is understood that Mr. Jerdon has applied for an extension of his leave, and his absence from the Presidency seems likely to be protracted for an indefinite period, the Committee are of opinion that, in advertence to the 2d Resolution at their Meeting, on the 1st October, 1846, immediate steps should be taken to supply his place as permanent Secretary to the Society.

VII. *Resolved*,—Accordingly, that the situation of Secretary be considered to have become vacant from the 1st January, 1847, and that Captain Losh be requested to accept it.

Captain Losh having signified his willingness to comply with the request of the Committee, resolved further, that he be appointed Secretary accordingly, and that, in conformity with Rule IX., a copy of this Resolution be forwarded for the approval and confirmation of the President of the Society.

In accordance with the 7th Resolution at the last Meeting of the Committee, a Memorandum is laid on the Table showing a sum of 12 Rupees received during the past month from four Subscribers on account of Nos. 30 and 31 of the Journal; the balance remaining uncollected is Rupees 260-0-0.

(Signed) J. J. Losh,
Officiating Secretary M. L. S., &c.

At a Meeting of the Managing Committee, held in the Society's Rooms, at the College, on Friday the 12*th February*, 1847.

Read letter to the address of the President of the Literary Society of Madras, from the Secretary to the Royal Society of Antiquarians of the North, dated Copenhagen, 19th November, 1845.

I. *Resolved,*—That the letter be recorded, and that the books,* and papers received with it be deposited in the Library for the use of Subscribers.

* Memoires de la société de 1840-1843-1844, Bulletin 1843.

Read letter from B. H. Hodson, Esq., dated Darjiling in Sikim, December 31st, 1846, to the address of the Secretary of the Madras Asiatic Society, enclosing two papers on Zoology, for insertion in the Society's Journal, and requesting that the Journal may be sent to him as formerly.

The Committee observe that this letter has been opened, and replied to privately, by Mr. C. P. Brown.

II. *Resolved,*—That consideration of the communication from Mr. B. H. Hodson be postponed until the return to the Presidency of the Chairman, when the expediency of resuming the publication of the Society's Journal will come under discussion.

Read Extract from Minutes of Consultation in the Public Department, No. 1112, dated 18th December, 1846.

III. *Resolved,*—That the scientific Reports and other papers received from Government, with this Extract from Minutes of Consultation, on the 15th ultimo, be deposited in the Library, that a list of them be circulated, and that the Librarian be instructed to deliver such of them as may be required for perusal by Members of the Committee, on receipts being sent to him for them.

A general Statement of the Society's Accounts for 1846, prepared and circulated since the last monthly Meeting, is laid on the table.

IV. *Resolved,*—That this Statement be approved, and laid before the Annual General Meeting of Subscribers, to be held on the 25th instant.

A letter from Messrs. Binny and Co., dated 25th January, 1847, and their Account Current with the Society for 1846, are laid on the table.

V. *Resolved,*—That the Account Current be laid before the Annual General Meeting, and that Messrs. Binny and Co. be informed that it has been examined and found correct.

Read Memorandum from Mr. C. P. Brown recommending the purchase of certain Works* by the Society.

VI. *Resolved,*—That, in the present condition of the Funds of the Society, it is not expedient to purchase expensive works of the kind in question; particularly as former editions of some of them are already in the Library.

* The new edition of Gibbon's Rome, with a translation of Guizot's notes edited by Milman, 1845.
The Pictorial History of England, 8 volumes, royal 8vo.
The Popular Encyclopædia, in 13 volumes, 8vo.

MEMO.
Wanted Edinburgh Review, Vol. 28, or Nos. 55 and 56 of 1817.
Do. Quarterly Review, Vols. 16 and 20, or Nos. 31 and 32 of 1816, and Nos. 39 and 40 being a volume of Index for first 19 vols.
Do. New Monthly Magazine, vols. 1, 2 and 3, or the first 12 Nos. of 1821 and vols. 22, 23 and 24, or 12 Nos. for 1828.
Do. Blackwood's Magazine, vols. 1, 2, 3, 4, 7, 8, 9, 10, 13, and 14, all in Nos.

A Memorandum, showing the Volumes and numbers of standard Periodicals required to complete the bound sets of each in the Library, is laid on the table.

VII. *Resolved*,—That inquiries be made as to the least expensive mode of obtaining the Periodicals in question, and that the subject be recommended at a future Meeting.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentlemen, since the monthly Meeting of the Committee, held on the 5th January, 1847.

Captain Green, Nos. 30 and 31,........	Rupees	4	0	0
Dr. Craske, Nos. 30 and 31, ...	,,	4	0	0
J. F. Thomas, Esq., 2 Copies of No. 31,...............	,,	4	0	0
W. Middlemass, Esq., No. 31, ...	,,	2	0	0
	Rupees..	14	0	0

VIII. *Resolved*,—That this Memorandum be recorded.

Read letter from Messrs. W. H. Allen and Co., dated 19th December, 1846, acknowledging the receipt of a remittance of £100, and advising the despatch of books by ship, and periodicals by steamer, for the Society.

IX. *Resolved*,—At the suggestion of Lieutenant Colonel Pratt, C. B., that application be made to Government for a Copy of the Aide Memoir of the Military Sciences, A, B, C, D, E, F, Edited by Officers of the Royal Engineers, it being understood that the work has been forwarded from England for distribution to certain Departments.

The Committee observe that their appointment of Captain J. J. Losh, to be Secretary to the Society, by the 7th Resolution at their Meeting on the 5th Ultimo, has been confirmed by the President as required by Rule IX.

(Signed) J. J. LOSH,
Secretary M. L. S., &c.

At an Annual General Meeting of the Madras Literary Society, held in the Society's Rooms, at the College, on Thursday, the 25th February, 1847.

The Secretary submitted to the Meeting, Messrs. Binny and Co.'s Account Current with the Society for 1846, showing a balance in favor of the latter, on the 1st January, 1847, of Rupees 790-11-0 and also a general account of the receipts and disbursements of the Society in 1846, and its credits and liabilities on the 1st January, 1847, showing a balance in its favor of Rupees 209-14-5.

I. *Resolved,*—That these accounts, which have been passed by the Managing Committee, and appear satisfactory, be approved accordingly.

Read letter from the Deputy Secretary to Government, in the Public Department, dated Fort St. George, 11th December, 1846, No. 1095, conveying the thanks of Government for the offer of the Society's Museum, which is accepted on the terms proposed, and stating that arrangements will hereafter be made for depositing it where it can be most advantageously placed. Observing, further, that it is apparently the desire of the Honorable the Court of Directors that the proposed Central Museum should not be one exclusively of Economic Geology but that it should combine many subjects of interest, and that it will be the object of Government to afford every facility for rendering the Institution as extensively useful as possible.

II. *Resolved,*—That the Society's Museum be accordingly made over to Government when applied for.

Read the following list of Donations of Books, &c., to the Society, since the last Annual General Meeting.

	Donors.
Reports, Correspondence, and Original Papers on various professional subjects connected with the Duties of the Corps of Engineers, Madras Presidency, 2d Volume.	The Officers of the Corps of Madras Engineers.
Memoires de la Societé des Antiquaires du Nord, 1840-1843....	Societé Royale des Antiquaires du Nord.
Memoires de la Societé des Antiquaires du Nord, 1844....................................	Ditto.
Antiquarise Tidsskript Udgivetafdet Kongelige Nordiske Oldskrift Selskab.................	Ditto.
Memoire Sur la Decouverte de L'Amerique au Dixieme Siécle,....	Professor Rafu.
The Bhagavata Purana translated into French, 2 Vols.,.	Government of France through the Translator, M. Eugene Burnouf.

III. *Resolved,*—That the above mentioned works be placed in the Library for the use of Subscribers, and included in the next Cata-

logue. It is observed that, the receipt of the work presented by the Officers of the Corps of Madras Engineers has been already acknowledged by the Managing Committee; while the receipt of the Bhagavata Purana with M. Eugene Burnouf's French translation, is stated to have been acknowledged by Mr. C. P. Brown, and the Secretary to the Royal Society of the Antiquarians of the North having requested that the receipt of his communication and donation may not be acknowledged at present, it appears sufficient to resolve, further, that the Donors are entitled to the thanks of the Society.

Read list of ten Members of the Society who have ceased to subscribe, left the Presidency, or died, and of ten who have become Subscribers since the last Annual General Meeting.

Ceased to be Subscribers.		*Became Subscribers.*	
1. G. Harding, Esq........	1st Class.	1. T. B. Roupell, Esq......	1st Class.
2. Rev. H. Harper,.......	do.	2. C. Sooboo Moodeliar,..	do.
3. J. C. Morris, Esq......	do.	3. W. A. Morehead, Esq..	do.
4. J. Macleod, Esq.......	do.	4. G. F. Fullerton, Esq....	do.
5. H. M. Rowlandson, Esq.	do.	5. W. S. Nesbitt, Esq......	2d Class.
6. C. T. Kaye, Esq.......	do.	6. J. Lawder, Esq........	do.
7. Lieut. Col. C. Taylor,....	2d Class.	7. Major T. T. Pears, C. B.,	do.
8. J. B. Key, Esq........	do.	8. Arthur Hall, Esq......	do.
9. Capt. M. J. Rowlandson,	do.	9. H. R. McDonell, Esq..	do.
10. J. Lawder, Esq...... .	do.	10. H. Nelson, Esq.	do.

IV. *Resolved*,—That these lists be recorded.

The Secretary having represented that Rule XIII., which prescribes that the Annual General Meeting shall be held in January, of every year, appears to require revision as the London Booksellers' Accounts to the end of each year are not usually received till about the middle of February, and, therefore, the Society's Accounts cannot be closed, and a statement of them prepared for submission to a General Meeting, till near the end of the latter month.

V. *Resolved*,—That a revised rule, to the following effect be substituted for the rule in question.

XIII. " That a General Meeting of the Subscribers be held annually, as soon as possible after the Society's accounts for the preceding year have been closed, and passed by the Managing Committee, and Statements of them prepared for submission to the General Meeting."

The Secretary reports that four Members of the Managing Committee are required to be nominated to supply the places of Assistant Surgeon Jerdon, W. McTaggart, Esq., the Rev. G. Knox, A. B., and T. Pycroft, Esq., the two former of whom have left, and the two latter are about to leave the Presidency.

VI. *Resolved, unanimously,*—That Lieutenant Colonel Watkins, Captain Worster, Captain Ludlow, and Dr. Middlemass, be requested to become Members of the Managing Committee.

VII. *Resolved,*—That the thanks of the Meeting be offered to the Honorable the President for his conduct in the Chair.

(Signed) J. J. Losh, *Secretary M. L. S., &c.* (Signed) Ewd. J. Gambier, *President.*

At a Meeting of the Managing Committee, held in the Society's Rooms, on Thursday, the 11*th March*, 1847.

Read Extract from Minutes of Consultation in the Military Department, dated 2d March, 1847, No. 1125, stating in reply to the application to Government of the Committee, made in conformity with the 10th Resolution at the Meeting held on the 10th ultimo, that the whole of the copies of the Aide Memoire of the Military Sciences received from England, have been distributed.

I. *Resolved,*—That the London Booksellers be requested to forward, for the use of the Society, the numbers of the Aide Memoire already published, and to send out regularly the future numbers as published.

Read letter from Messrs. W. H. Allen and Co., dated 19th January, 1847, forwarding a statement of their account with the Society for 1846, and advising the despatch of periodicals per steamer.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31, have been received from the following Gentlemen since the last Monthly Meeting of the Committee, held on the 12th February, 1847.

J. Ouchterlony, Esq., No. 31			Rupees	2	0	0
Colonel W. Strahan,	,,	,,	,,	2	0	0
Sold one Copy,	,,	,,	,,	3	0	0
C. J. Bird, Esq.	,,	,,	,,	2	0	0
			Rupees..	9	0	0

III. *Resolved,*—That this Memorandum be recorded.

(Signed) J. J. Losh, *Secretary M. L. S., &c.*

At a Meeting of the Managing Committee, held in the Society's Rooms, on Monday, the 12th April, 1847.

In conformity with the 2d Resolution at their Meeting held on the 12th February last, the Committee proceed, with particular reference to the communication from B. H. Hodgson, Esq., to take into consideration the expediency of resuming the publication of the Society's Journal.

I. *Resolved,*—That there appears no sufficient reason for permanently discontinuing the publication of the Society's Journal, and, accordingly, that arrangements be made for publishing the 32d Number, for which (including Mr. Hodgson's papers*) almost sufficient matter seems already available.

Resolved, further,—That application be made to all Members of the Society who do not subscribe to the Journal for their support to the latter, and that, as soon as a selection can be made from the scientific Reports and other papers received from Government, it be proposed to Government that the papers so selected shall be published in the Journal,† such pecuniary assistance, as may be deemed sanctioned by the orders of the Honorable the Court of Directors, either by defraying a proportion of the expenses of the Journal, or by subscribing permanently to it an adequate monthly sum, being at the same time applied for.

Resolved, further,—That literary and scientific contributions to the Journal be invited.

* 31st March, 1847.
† 10th April, 1847.

Read letters from J. U. Ellis, Esq.* and Captain Ludlow,† tending the resignation of their offices as Members of the Committee in consequence of being about to leave the Presidency.

II. *Resolved,*—That to fill up the vacancies occasioned by their resignation, and in accordance with Rule X., C. P. Brown, Esq., and E. B. Powell, Esq., be requested to become Members of the Committee.

* 29th March, 1847.

Read letter* from T. Boileau, Esq., stating that he has left at his house exposed for sale about 1,000 volumes of standard and most useful works to which he begs to invite the choice of the Committee; and offering, in particular, a copy of Forcellini's Latin Lexicon in 2 volumes quarto, at the price for which he obtained it as a favor, viz. Rupees 50.

III. *Resolved,*—That the Librarian be requested to obtain, if possible, a Catalogue of the books in question, showing their respective prices, in time for circulation to the Committee prior to the day fixed for their sale. It is observed that the Society's Library is already provided with a copy of the particular work mentioned by Mr. Boileau.

* These papers, having in the interim appeared in the Calcutta Journal of Natural History, were not published by the Society.

† Notices of some of these will be found in No. 32 "on the Gold Mines of Malabar," and in the present No. "on the labours of Dr. Turnbull Christie."

* 18th March, 1847.

Read letter* from Lieut. Colonel Pratt, C. B., suggesting that the Society should be in possession of the work published under the title of "Papers on subjects connected with the duties of the Corps of Royal Engineers" edited by Captain Denison, R. E., of which eight Volumes in 4to. bound in cloth at the price of £ 11-6-0 have already been published. The Librarian informed the Committee that Captain Ludlow has tendered to the Society a new and uncut copy of the above work at 15 per cent. less than the original price.

IV. *Resolved,*—That the offer of Captain Ludlow be accepted, and that he be requested to direct the forthcoming volumes of the work to be transmitted to the Society as published.

Read Extract from Minutes of Consultation in the Public Department, No. 278, dated 17th March, 1847, conveying instructions to the Civil Auditor, to continue to pass the Bill for the salaries of the three individuals attached to the Native Library in the charge of the Society, until the arrangement sanctioned by Government on the 5th January, 1847, has been carried into effect.

V. *Resolved,*—That the Chairman and Secretary, as Members of the late Sub-Committee which recommended the arrangements adverted to in this communication from Government, be requested to take the requisite steps for carrying them into effect at as early a period as practicable.

No. 1. Bituminous limestone pebble from shore of Dead Sea.
No. 2. Vesicular basalt from the Havuran E. of Jordan.
No. 3. Compact fossile basalt, extinct Volcano of Cara Devlit.—Katakekaumene, Asia Minor.
No. 4. Vein of greenchert in Trachyte of Smyrna.

The Chairman produces four mineral specimens, as per margin, received by him from Captain Newbold, for the Society's Museum.

VI. *Resolved,*—That the specimens in question be deposited in the Museum, and that the Chairman be requested to offer the thanks of the Committee to Captain Newbold.

Read letters from Messrs. Wm. H. Allen and Co., dated 29th January, and 19th February, 1847, advising the despatch of books per Ship *Tartar*, and of periodicals per Steamer, for the Society.

The Secretary reports that since the last monthly Meeting, J. U. Ellis, Esq. and D. Ross, Esq., have intimated their intention of ceasing to subscribe, and that C. St. John, Esq., and C. V. Conniah Chetty, have become Subscribers, the former in the first, and the latter in the second class; and, also, that the number of Resident Members has been considerably reduced since the commencement of the present year.

VII. *Resolved,*—That, as it is believed that many Gentlemen are prevented from joining the Society by want of sufficient knowledge of its objects, regulations, and terms of admission, a sufficient number of copies of the Rules with corrected lists of the Resident and Non-Resident Members, be printed for transmission to all eligible parties on their arrival at the Presidency.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentlemen since the last monthly Meeting of the Committee held on the 11th March, 1847.

Capt. S. Best, No. 31,......	Rs.	2	0	0
R. B. Bell, Esq......	,,	2	0	0
Capt. T. J. Newbold, Nos. 30 and 31,.	,,	4	0	0
Major F. J. Clerk, No. 31, two Copies, ...	,,	4	0	0
	Rups..	12	0	0

VIII. *Resolved,*—That this Memorandum be recorded.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secy. M. L. S., &c.*

At a Meeting of the Managing Committee, held in the Society's Rooms, on Monday, the 7th June, 1847.

Read letter from the Secretary to the Archæological Society of Delhie, dated Delhie, 5th May, 1847, requesting that the Madras Literary Society will follow the example of the Asiatic Society of Calcutta, and contribute a complete set of their Journal to the infant Library of the newly formed Archæological Society, which compliment will be returned as soon as the latter become able to undertake the publication of their own transactions.

I. *Resolved,*—That a set of all the procurable numbers of the Society's Journal be forwarded to the address of the Secretary to the Archæological Society of Delhie, and that he be informed that the remaining number swill be transmitted as soon as they can be obtained. Lieut. Col. Pratt, C. B., having kindly offered to take charge of the parcel for the Secretary to the Delhie Archæological Society, and to transmit it to Calcutta in the care of a Gentleman about to proceed thither, his offer is accepted with thanks.

The Secretary reports that it has been found impossible to obtain at Madras the numbers* of the Society's Journal required to complete the set supplied to the Royal Academy of Sciences of Bavaria.

* No. 2, 3, 4, 12 and 13.

II. *Resolved,*—That Messrs. Allen and Co. be called upon to forward a list of all the numbers of the Journal remaining in their charge undisposed of, and that a list of those remaining in the Library at Madras be prepared for the information of the Managing Committee. C. P. Brown, Esq. undertakes to ascertain and inform the Committee what

would be the cost of re-printing the deficient numbers of the Journal, should this be hereafter considered expedient. As soon as sufficient information on this subject is obtained, the Committee propose to take steps to furnish the Royal Society of Antiquarians of the North with a complete set of the Journal, in return for the publications of that Society, forwarded from Copenhagen, in November, 1845, and received at Madras in the latter part of last year.

III. *Resolved*,—That Robert Wight, Esq. M. D., be requested to assist the Managing Committee in obtaining a supply of objects of Natural History, especially dried plants, for transmission to the Royal Academy of Bavaria, in compliance with the request contained in their Secretary's letter, dated Munich, 10th May, 1846; and that the Secretary to the Asiatic Society of Bengal be applied to for information, respecting the Academical publications stated by the Secretary to the Royal Academy of Bavaria to have been sent for the Madras Literary Society, to the care of Henry Torrens, Esq., Vice President of the Asiatic Society of Bengal.

Read letters from Messrs. Wm. H. Allen and Co., dated 20th February, 17th March, and 19th April, 1847, advising the despatch of books per *Windsor*, and of periodicals per Steamer, for the Society.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentlemen since the last monthly Meeting of the Committee held on the 12th April, 1847.

Lieutenant Colonel Felix, No. 31, ...	Rups.	2	0	0
Captain Lockhart, Nos. 30 and 31,....................	,,	4	0	0
The Most Noble the Marquis of Tweeddale, K. T. and C. B., No. 31..	,,	2	0	0
	Rups..	8	0	0

IV. *Resolved*,—That this Memorandum be recorded.

V. *Resolved*,—At the suggestion of C. P. Brown, Esq., with reference to the 8th Resolution at the last Meeting, that a Catalogue of the Society's Library be circulated to all eligible parties at the Presidency, who do not subscribe to the Library, to give them the opportunity of expressing their intention of becoming Subscribers by inserting their names in a list to be sent with a Catalogue.

VI. *Resolved*,—That as the attendance at the late Monthly Meetings has been very small, the Monthly Meetings be in future held at the Club

House, at 7 o'clock, P. M., on the 1st Tuesday in each month, as was the custom up to the close of last year.

VII. *Resolved,*—That a copy of Shelley's Poetical Works offered for sale, at the price of 7½ Rupees, by Mr. Higginbotham, be purchased for the Library.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee, held at the Club House on Tuesday, the 6th July, 1847.

Read letter, dated Munich, 26th April, 1847, from the President and Secretary of the Royal Academy of Sciences of Bavaria, intimating, that certain works published by the Royal Academy have been transmitted for the acceptance of the Madras Literary Society; and that, upon closer inspection of the works in the Library of the Academy, various deficiencies have been discovered in the works furnished by the Literary Society.

The Committee observe that a box, containing works published by the Royal Academy of Sciences of Bavaria, has been recently received; and that measures are already in progress to obtain the works required to supply the deficiencies pointed out in the publications forwarded to the Academy.

I. *Resolved,*—That on the receipt of the expected communications from R. Wight, Esq., and the Secretary to the Asiatic Society of Bengal, in reply to the letters recently addressed to them by direction of the Committee, the receipt of this letter, and the former one on the same subject, and of the publications adverted to, be acknowledged, and the best thanks of the Society offered for the donation.

MEMO.

I called on the Manager of Vepery Press, to calculate the cost of re-printing the missing Nos. of the Madras Journal, and I handed him my own Copy for inspection. The accompanying is his reply.

The charge seems rather high, but I am not sure we could get the work done more cheaply.

I herewith present to the Literary Society, a copy of Sterne's Tristram Shandy which, in the beginning of Vol. 3, bears the Author's signature.

(Signed) C. P. BROWN.

10*th June.*

Read Memorandum from C. P. Brown, Esq., having reference to the 2d Resolution at the last Monthly Meeting.

II. *Resolved,*—That even should it be found impossible to obtain the deficient numbers of the Journal, the present condition of the Society's Funds would not admit of Volumes 1 and 4 being re-printed at a cost of upwards of 1,250 Rupees. The consideration of the subject is therefore postponed, until the receipt of the reply of Messrs. Allen and Co., to the letter recently addressed to them, respecting the numbers of the Journal in their charge. Resolved further, that the thanks of the Society be offered to Mr. Brown, for his donation to the Library.

Read letters from Messrs. Wm. H. Allen and Co., dated 30th April, and 19th May, 1847, advising the despatch of books per *Seringapatam*, and of periodicals per Steamer, for the Society.

J. Goldingham, Esq....1st Class.	
R. B. Bell, Esq........	do.
W. U. Arbuthnot, Esq.	do.
D. Mackenzie, Esq.....	do.
Lieut. A. H. Hope,.....	do.
A. W. Phillips, Esq....2d Class.	
Captain L. Desborough, under Rule IV.	
Lieut. J. S. Menzies,...	do.
Lieut. H. J. McCrie, ..	do.
Lt. Col. L. W. Watson,	do.
Lieut. A. Campbell,....	do.

The Secretary reports that eleven new Members have been admitted since the last Meeting.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following gentleman, since the last Monthly Meeting of the Committee, held on the 7th June, 1847.

J. A. Hudleston, Esq., No. 31..,..............................Rups. 2 0 0

III. *Resolved*,—That this Memorandum be recorded.

(Signed) Walter Elliot, *Chairman.* (Signed) J. J. Losh, *Secretary M. L. S., &c.*

At a Meeting of the Managing Committee, held at the Club House, on Tuesday, the 3d August, 1847.

Read letter, dated 2d July, 1847, to the address of the Librarian, from C. A. Roberts, Esq., inquiring if there is any objection to his having some of the stock books of the Society's Library sent to him at Cuddalore.

The Committee are of opinion that, under the present Rules, the request made by Mr. Roberts cannot be complied with. As, however, it would appear, from several remarks made in circulation on the application in question, that there is a strong feeling in favor of the extension of the advantages of the Library to Subscribers at out-stations, it may, perhaps, be found expedient to recommend to the Subscribers some modification of the existing Rules, and it is, therefore,

I. *Resolved*,—That any specific propositions on the subject, which Members of the Committee may think proper to make, be considered at a future and fuller Meeting.

Read Memorandum* from the Chairman of the Committee, forwarding for circulation a paper extracted from some of the scientific Reports received from Government

*Dated 31st July, 1847.

in the beginning of this year, containing an account of proceedings connected with the search for gold in the Province of Malabar.

As the paper was received too late to be circulated before the present Meeting.

II. *Resolved,*—That it be now circulated, as a specimen of the way in which it is proposed to employ the scientific papers placed at the disposal of the Society by Government, and that should no objection be offered to the arrangement, an offer be at once made to Government, to prepare, in the same way, for publication, such of these papers as appear to be of value and present interest. Further, that it be suggested that the Society's Journal would be the best medium for the publication of the papers in question, and others of a similar description, of which many may be probably found amongst the public records.

Read letters from Messrs. W. H. Allen and Co., dated 14th and 19th June, 1847, advising the despatch of books per *Wellesley*, and of periodicals per Steamer, for the Society.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the Table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentleman, since the last Monthly Meeting of the Committee, held on the 6th July, 1847.

Mr. J. H. Kenrick, No. 31,....... .... Rups. 2 0 0

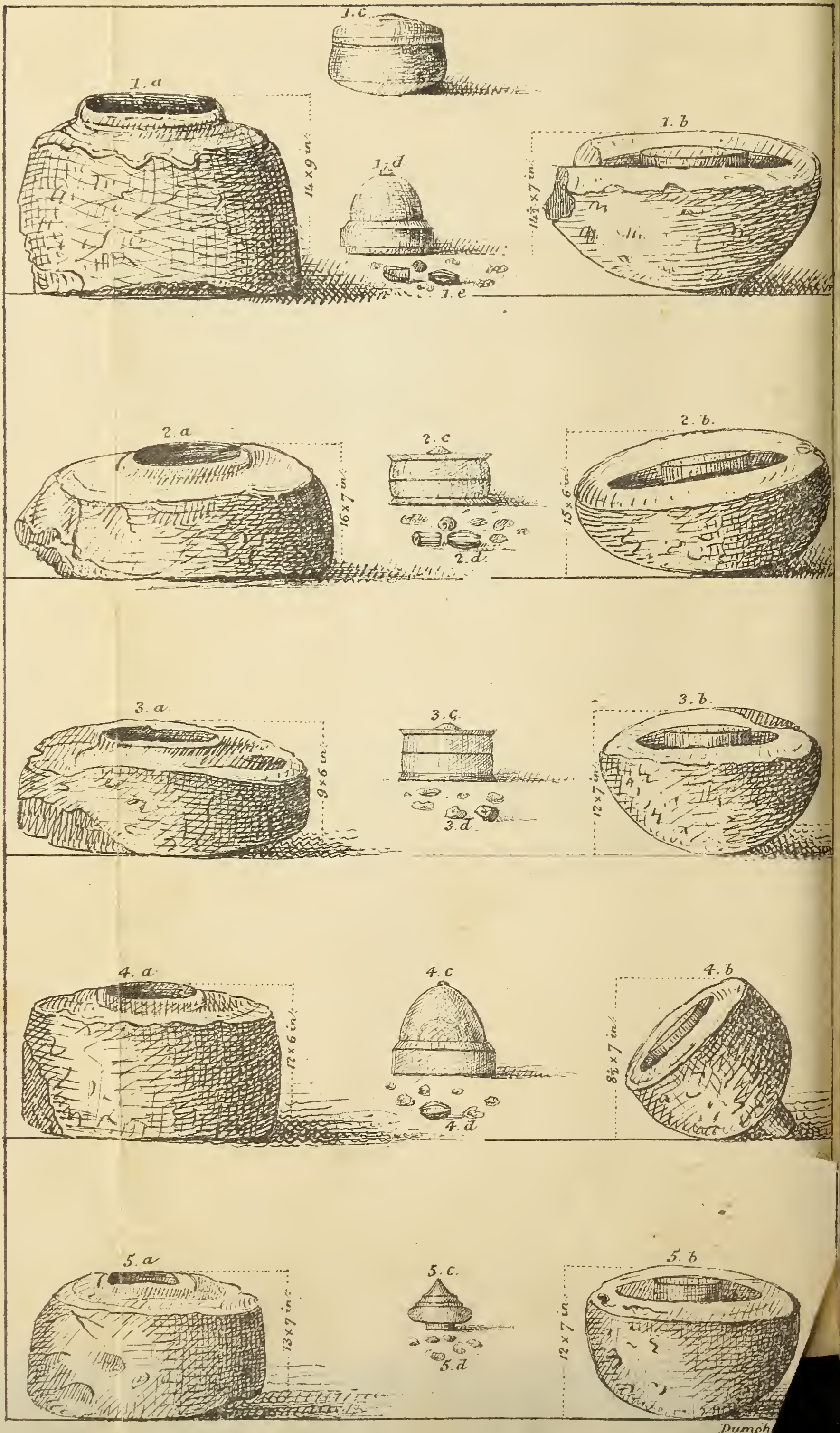
III. *Resolved,*—That this Memorandum be recorded.

(Signed) WALTER ELLIOT, *Chairman.*

(Signed) J. J. LOSH, *Secretary M. L. S., &c.*

ERRATUM.

In margin of page 193—For Dr. White, *read* Dr. Wight.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Dumph

MADRAS JOURNAL

OF

LITERATURE AND SCIENCE.

No. 35. *January—June*, 1849.

I. *Statistical Report on the Circar of Warungul. By* A. WALKER, ESQ., *M. D., Bombay Establishment, Nizam's Service. Communicated by Major General* FRASER.

THE Circar of Warungul, as it is called by the Mahomedans, but by the Hindoos Warunkal—a name derived from two Canarese words signifying the place of the touchstone, or, more literally, of the black stone—is situated between 17° 24′ and 18° 24′ north latitude, and 79° 11′ and 80° 22° east longitude; its boundary comprising an area (including enclaves of adjacent areas) of 3,266 square miles. Its extreme length from east to west is about 80 miles, and its breadth from west to south 70 miles. The Ramgheer, Mullangore, and Elgundel Circars bound it to the north. On the east it has the Ramgheer and Kummemmet Circars. On the west Bowngheer, and on the south Kummemmet and Nulgoondah.

So dove-tailed is this Circar with others, that without a very accurate map it would be impossible to state its area with exactness. The southern portion has been surveyed, and mapped, and the results published, but the map of the northern portion, though surveyed, has not yet been given to the world.

Though the name *Circar* would seem to imply that the division is of Mahometan creation, it is doubtful if it is so. On the contrary, from the existence of one family of Surdeshmookhs and of Surdeshpundyahs it is more probably a division derived from the times of Hindoo rule and supremacy—and adopted by the Mussulmans (who contented themselves by changing the name) for the mere purposes of convenience. The substitution of the Norman name of county for the Saxon shire, without disturbing its boundaries, offers a parallel to this.

The *Circar* is divided into *Pergunnas*, which, when large, are again subdivided in *Talookas*—the division of *Turufs*, though acknowledged, is only spoken of in one or two of the more wealthy and populous pergunnas—very often the divisions of talookas and pergunnas are confounded together by the natives, and the number of the latter is sometimes stated at fourteen, while, by including some of the former, it is raised as high as eighteen at others. The map annexed will afford a tolerable idea of these purely artificial divisions, and the table in the Appendix, No. 1, contains the names of the pergunnas and talookas and the number of villages, according to an assessment called the *koolkamil.*

Geological Features.

The chief geological formation of the Circar is sienitic granite composed of quartz, felspar, and horneblende. The next is gneiss passing occasionally, by a very natural transition, into horneblende schist. The third is sandstone. Although the minerals noted above constitute the prevailing sienitic rock, it by no means follows that no other mineral components occur—of these the chief are:

1st. The pegmatite of French writers, from which horneblende is excluded, and the rock consists of quartz and felspar alone. The first mineral sometimes so predominates, that, appearing in pieces from the size of a hazel nut to that of an egg, it gives the rock the look of a conglomerate. The felspar in this variety is very commonly flesh coloured—this is a frequent form occurring in the neighbourhood of Warungul and at Dogundah in the road between Pakhall and Mahdapoor.

2d. Felspar and horneblende, this is a loose crumbling variety which wears, and is finally decomposed, by the weather. Common.

3d. Quartz, felspar and actinolite. The latter mineral taking the place of the horneblende and giving to the rock a greenish

colour. This variety may be seen in the bed of the tank at Nagwarum.

4th. Quartz, felspar, horneblende, and mica—sought by the natives to make their hand-mills—lime crushers, on account of its toughness. These constitute the chief varieties.

Gneiss. It is often difficult to distinguish this from the preceding, but its stratification, when it occupies a position in the gorges of hills, cannot be mistaken—this happens at the Iron Hill, twelve miles to the west of Warungul, where it passes into horneblende schist—and, from its broken and dislocated appearance, must have been subjected to some disturbing cause—it is usually of horneblende and felspar, with some quartz. The oxygenated iron ore occurs in this formation—the horneblende first gives place to the iron ore—gradually the other minerals disappear, leaving the iron stone a nearly homogeneous mineral but still preserving the layer-like form of the parent rock.

The sandstone occupies the extreme east and north-east of the Circar meeting with the granite a half mile on the Warungul side of the Pakhall lake, of which it forms the basin. At Bagartepett, on the road from Hunnumcondah to Mahdapore, there is a band of argillaceous limestone, of the breadth of three miles, intervening between the granite and the sandstone, much disturbed at its contact with the former, and probably underlying the latter, to a wide extent, as it appears again in that position in the Godavery river to the north; and it would seem to be a process sent down from the sandstone of that locality, possessing the lithologic characters of that formation as described by Voysey. The Coorwah talooka of the Pakhall pergunnah is a congeries of sandstone hills covered with wood. The low undulating hills of this formation contrast strongly with the abrupt peaks and rugged summits of the neighbouring granite.

The greenstone veins penetrating the sienite are found in this district, but not of the breadth or extent of those in the neighbourhood of Hyderabad—so much so, that there is reason for believing, on the testimony of the natives, that the stone used for the ornamented pillars and cornices scattered so profusely over the ruins of Warungul, was not quarried in the neighbourhood but brought from some distance. The only mineral I observed in the greenstone was a greenish felspar—crystallized. Mortars are

constructed of this stone, in great use among the native druggists.

Quartz veins also occur, varying in thickness from a rupee to several feet—the superior hardness and durability of the quartz causes it to appear as a ridge in the sienite.

Hard as the sienite and gneiss are, there are few rocks more subject to disintegration and decay, and to consequent change; of these three are particularly well marked.

1st. The ochreous degeneration—where the horneblende becomes decomposed, and a red, or more generally, a yellow ochre is produced. The appearance put on by these rocks while undergoing this change so nearly approximates to that of sandstone, that from a hand specimen an experienced observer even might be deceived regarding the real characters of the rock—but from this error he would be freed by breaking it, when a nucleus of the original rock would be discovered, surrounded by decomposing layers of ochreous matter.

2d. The steatitic degeneration—for such it is according to the opinion of some German mineralogists, who regard it as a change analogous to the adipocere of animal matter—happens at a village called Dummenapilly in the Vizianuggur pergunnah, where it is mined and shaped into pots and cups by the blacksmiths. The rock at the surface is gneiss with horneblende and mica for two of its ingredients, and much less steatitic than what is found at some depth—so much so as to render it unfit for being cut into vessels—(can the pot stone of Mysore mentioned by Buchanan be this rock?) but it differs in its lithologic character from that mineral. Pencils for school boys are manufactured from it, and also lings for the use of the Lingayets around Warungul.

3d. The *mohrum*, in which felspar would seem to be originally the predominant rock—it is frequently cut by veins of disintegrated limestone, and nodules of hard limestone are also found in it: may not the lime have acted as a powerful agent in forwarding the decomposition by the formation of neutral salts?

Minerals.

Oxygenerated iron ore, sp. gravity 4·3 to 4·8, giving an average of 4·5, extensively found and worked.

2d. Titaniferous iron ore, sparingly found and not worked—a specimen in my possession was dug up in sinking a well at Hunnumcondah in the soft *mohrum*.

3d. Titaniferous iron sand, found abundantly in nullahs, where its weight prevents its being swept down with the sand—not worked.

4th. Hœmatite, found near Warungul, scattered on the surface of the ground—not worked.

5th. Pisiform iron ore, universally diffused throughout the granite—not smelted.

6th. Yellow and red ochre—the last found embedding the oxygenated iron ore—it is used by the common people for daubing their houses with.

7th. Milk quartz and, occasionally, rose quartz, is met with—the last is sometimes cut for ring stones, but it is reckoned of little value. I have not observed any of the amethystine quartz, so common elsewhere, about Warungul.

Limestone has been already mentioned—it is burned by *dhobees* and other low castes, and sold for one rupee a maund. The subcarbonate of soda mixed with deliquescent salts is every where abundant over the Circar, efflorescing on the soil—it is used in its rough state by the *dhobees*, but is never refined for exportation.

Besides these minerals others were brought to me from the hills, which do not belong to the sienitic rock—jaspers, cornelians, and agates. On inspecting them, very distinct evidences of their having been cut into the form of cutting instruments and knives showed themselves. Those shaped as cutting instruments seem to have been thrown aside on being found to be useless, as they had invariably a jagged uneven edge, and appeared as if broken off short. The arrow heads, though rude, are pretty distinct. The same fragments were discovered by Doctor Primrose of the Nizam's Service at Lingsoogoor, to the south of the Kistnah, where the rock is of the same description as at Warungul—and their analogy to the obsidian knives of Mexico, where he had been resident, was noted by him.

It is useless to conjecture respecting the people who employed these instruments; especially in India, where the use of iron has long preceded every authentic or even conjectural history.

It has been stated that the sienite is the prevailing rock, and the country takes its prominent features from the oft described and familiar characters of that well known rock.

1st. The solitary herbless dome shaped hill. Drg. I.

2d. The feather bed appearance of Macculloch. Drg. II.

3d. The prismatical fractured summit. Drg. III.

4th. The *tors* and logging stones, which give a wild and fantastic appearance to a country, and which have been lately mistaken for real boulders, but to which they have no geological relation whatever.

This singular structure has seized on the native imagination, and the monkey god Hanumaun is said to have piled up these stones, as spare ammunition in the great war of the Ramayana.

Drawing IV., marks on single block.—Drawing V., one block piled on another.—Drawing VI., four and five tiers of blocks—the last two may be deemed rare, two or three being the most common.

Drawing VII.—Shows a cave in the sienite extending inwards for fifty or sixty feet and about two and half feet in height—this is not common—fragmentary portions of rock sometimes form pseudo caves. The natural aspect of the Circar is certainly hilly, and the country about Warungul, though little elevated beyond the usual seventeen hundred feet above the level of the Sea which marks the eastern portion of the Deccan, is the watershed—the 'divortio aquarum' from whence both the Godavery and Kistna are supplied with the sources of tributary streams. At the southern extremity, a group of hills run east and west, and communicate with the hills of the Vizianuggur talooka.

Ten miles to the N. W. of Warungul another group, the Chandragiri hills, spring from the plains with pinnacled summits. The Iron hills, as they are called, fourteen miles due west of Warungul, and of which a representation is given in Drawing VIII.—form a double range, varying north and south, with a gorge between. The ridge towards the east (the one represented) terminates abruptly after a course of four or five miles, but the western doubles in itself and throws out a spur to the north-west. There are besides smaller groups as at Hunnemcondah—but these, as elsewhere the isolated hill, is the prominent feature of the landscape. On the other side of the Chandragiri group, and towards the Pakhall lake, the country gets flatter and uninterrupted by hills, whether single or clustered.

Soils.

These may be divided into the black, red, and sandy.

The black is the *regur* of other parts of India, its productive properties being chiefly affected by the quantity of lime it may contain.

1st. The *cutta regurree*—a stiff loam with little soluble matter and not much lime—in very rainy seasons this is found a good soil for jowaree.

2d. The *regur*—the well known soil of all India.

3d. *Paurah*—good garden soil with about seven per cent. of lime, too pulverized and not in fragments as in the two last.

4th. *Pawtee zumeen*, also a garden soil, with about the same proportion of lime as the last, but that mineral not so much in powder.

5th. *Sota zumeen*—a whitish coloured soil, differing little from the last—it is cultivated in the rains for the abee crop of rice.

6th. *Choona ka puttur ka regurree*—a rough soil very rich in lime—nearly twelve per cent.—good for jowaree, gram, &c.

7th. *Chowka regurree*—a transition from the black to the red soil—not much lime.

8th. *Cuttay sowda*—a black soil, with quartz, pebbles and a small proportion of lime, not above one per cent.

9th. *Rewa zumeen*—a finely pulverized red soil well qualified for poonass crops—it has a dash of lime in it.

10. *Yerrah chukkoo*—also a red soil but not so fine as the last—parts easily with its moisture—contains a small proportion of lime—good soil for some of the poonass crops, yellow jowaree, bajree tillee, hurra mong.

11th. *Ghersoo boomi*—a strong red soil—fitted also for poonass crops.

12th. *Pala sauroo.*

13th. *Sallee doobboo*—mere sands, scarcely ever cropped—the latter, it is said, may produce cooltee.

The waters of the Circar.

1st. *Kara panee.*—This water contains a proportion of sub-carbonate of soda and of muriates chiefly magnesian. On the evaporation of six ounces there were eight grains of the sub-carbonate of soda and four of deliquescent salts—which yielded a thick precipitate to the phosphate of soda and ammonia—and but slightly became dim on the addi-

tion of oxalic acid: compared with distilled water it was as 1,000 to 996, from which it may be inferred that it consisted of

996 parts of water.
2·5 of sub-carb. of soda.
1·5 of muriate of magnesia, with a trace of lime.

This water is preferred for most garden produce; for fenugreek, tobacco, and vegetables generally, save the *Arum nyphœfolium;* also for decocting the *mahwa* previous to fermentation—it acts on the brass lota—it is also used in preference for Indian corn.

2d. *Meeta panee.*—This left on 996½ grains scarcely any residuum—it is the common drinking water, and reckoned good for irrigating rice—sp. gr. to distilled water as 997 to 996.

3d. *Sowta panee.*—This water is excessively sweet, but said not to slake the thirst—its taste depends on about two grains and a half to the ounce of water of sub-carbonate of soda that exists in it; its sp. gr. to distilled water was as 997½ to 996.

4th. *Sowka panee.*—Neither very sweet nor bitter; its sp. gr. 996½ to 996 of distilled water, which may be accounted for by its having got putrid and becoming impregnated with sulphuretted hydrogen to the expulsion of atmospheric air. This water, good for the irrigation of ginger, radishes, cresses, and garlic—and also for wheat and rice—never used for tobacco; wholesome too for drinking, as it is said by *hakeems* to be more warm than cold. It contains a very small proportion of sub-carbonate of soda, and its medical properties may be traced to a portion of combined sulphur it may contain.

Considering the shortness of the time that has occurred since my undertaking this duty, I need not offer any apology for forbearing to enter into any detail respecting the climatalogy of the Circar—suffice it to say, the climate would appear to differ little from that of Hyderabad, a bad season in the one being universally a bad season in the other. The hot season of last year was unusually cool at Hyderabad; the same thing happened at Warungul, and the heavy rains of September, which have since filled the tanks, set in at both places on the same day. The divisions of the year deemed natural by the agriculturist, and which in the rains he watches with intense interest, are in number twenty-seven, consisting of from fourteen to fifteen days each. It is a puzzling question to the Brahmin astrologer how he can make

twenty-seven *cartees* of that duration out of the solar year—but he evades it by saying this duration is shortened in the hot months—they are well known to be the lunar changes of the side-real year. Although the real commencement of the year is two months before—to please the cultivator the first cartee is made the one which has the greatest interest for him.

1st. *Margasirra.*—If this *cartee* is ushered in by a full moon a good augury is derived from the circumstance—a new moon is not so favourable—if rain falls there will be a good fall for the next five cartees.

2d. *Ahredrah.*—Tillage and sowing the *poonass* begins; insects appear in great numbers.

3d. *Pedda-poosheala.*—Insects commence to attack the young *poonass* crops—rain less.

4th. *Chinna-poosheala.*—*Abee* crops of rice sown.

5th. *Asaleshoo.*—Rice sowing continues.

6th. *Mugha.*—Crops of abee rice sown, if it thunders in this cartee rain will fall for the next five *cartees.*

7th. *Phoobha.*

8th. *Ooturhah.*—Much rain to be looked for, *oord* and *cooltee* sown.

9th. *Husturhee rubbee.*—Crop sown—*poonass* crop ripening.

10th. *Chitthee rubbee.*—Crops continue to be sown, yellow *jo-waree* and the millets reaped.

11th. *Soathee.*—When rain falls in this *cartee* it is considered favourable, if there be lightning the sign deemed good.

12th. *Vishaka*—if rain falls now it is looked on as unfavourable to the crops and fruit of all kinds.

13th. *Anurádha.*—*Tábee* crops of rice sown.

14th. *Jestha.*—Continue to sow *tábee.*

15th. *Moolha.*—If it blows in this month rain falls.

16th. *Poorwashadah.*—Sow melons, gourds.

17th. *Ooterashadha.*—Hot weather begins.

18th. *Srewannam.*—Hot weather fairly set in.

19th. *Danistha.*—Rice ripening.

20th. *Shitaveshum.*—Rice ripens and becomes fit for the sickle.

21st. *Poorwabadrah.*

22d. *Ootrabadrah.*

23d. *Rewuttee.*

24th. *Ashwinnee.*

25th. *Burnhee.*

26th. *Krootika*—black soil cracks.

27th. *Rohinee.*

The grain chiefly cultivated in this Circar is rice and of this there are many varieties of which the chief are as follows:

1. *Batee-ka-dhan*—a middling sized grain with a reddish husk—it is considered of light and easy digestion, and is given to invalids.

2. *Gunta moola kulloo*—a large grain with a whitish husk—thought wholesome and to be good for rheumatic pains.

3. *Gurka sunnaloo*—a small grain ready in three months after sowing.

4. *Putcha gunnerloo*—grows in the neighbourhood of Pakhall lake—esteemed a good grain.

5. *Soopuaraynaloo*—an *ábee* rice—sprouted seed used and great care taken in transplanting; it is productive and is a good rice.

6. *Bungaroo tigualoo*—of a golden colour—hence its Telingee name—a small grain.

7. *Koonkaowapoophloo*—called the small almond rice from its red colour and form.

8. *Moodgootomelloo*—a small red grain.

9. *Kakalapuchelloo*—this grain in husk has a winged appearance.

10. *Yeepawudloo*—a large rice.

11. *Mussoora wudloo*—a middling sized grain with a darkish husk—compared to the hide of a donkey in colour.

12. *Puly musaloo*—tiger's beard rice.

13. *Goodaree ooskilloo*—a sweet-smelling small rice.

14. *Chitteemootcalloo*—pearl rice—sweet-smelling.

15. *Goombojooloo*—a large rice, colour compared to the flower of the tamarind, with this sort Mahdev sprinkled his wife's head.

16. *Kutta keesmuraloo*—a productive variety.

17. *Booleemachelloo*—sown on saltish soil, reddish, a coarse rice.

18. *Tellamachelloo*—a cheap coarse rice.

19. *Tateepelloo*—like sago, small, husk of a dark colour—sweet-smelling—a dear rice.

20. *Kakerekalloo*—an *ábee* rice, dearest of all—a small quantity sown in this Circar—husk darkish.

21. *Chamakooraloo*—a flavourless rice—large, cheapest of all.

22. *Chundramunkaloo*—husk silvery—a good rice.

23. *Kongagoorloo*—husk whitish.

24. *Patee moolkaloo*—small white not common.

25. *Adengaloo*—a coarse rice used by the poorer classes—grows in land much flooded.

26. *Boorawedloo*—coarse.

27. *Reddy sawmee kat killoo*—antimony rice, small, sweet-scented.

28. *Donrasenkeuloo*—odourless, large and coarse.

29. *Mylasamaloo*—a small coarse grain.

30. *Dodasamaloo*—large whitish.

31. *Gareederoudloo*—reddish husk, and even when unhusked the grain retains the colour—used by the poor.

32. *Boonjaloo*—also coarse, chiefly sown in the dry bed of the Pakhall lake by the *Surmooneewar*.

Most of these varieties remain in the ground from three to four months; the transplanted kinds require a few weeks more to ripen, but transplanting amply repays the additional trouble and expense. The fifth variety the *Soopuarávnaloo*, an *ábee* crop which is transplanted, requires five months and a half to ripen—and the 19th *Tateepelloo*, and the 20th *Kakerekulloo*, both fine varieties, five and six months respectively.

Dry Grains Cultivated.

Andropogon Sorghum—three varieties, the yellow red and white—*Jonaloo* (Telingee).

Andropogon bicolor—black *jowaree*.

Zea Mays—Indian Corn—*Muckkae.*

Panicum Spicatum—*Bajree*—*Sudgaloo* (T.)

Panicum Italicum—*Kunghne*—*Kooraloo.*

Panicum hispidulum—*Boora sama.*

Another variety—*Pota sama.*

Panicum frumentaceum—*Shama.*

Panicum miliaceum—*Worgloo.*

Paspalum scrobiculatum—*Aruga.*

Triticum æstivum—Wheat.—Of these the yellow, white, and red *jowarees* are in common cultivation, and also the *shama*. The cul-

tivation of the Indian corn is becoming more frequent every year, and bread and other articles of diet are made from its meal.

The *boora* and *pota sama* are coarse grains, used when husked like rice by the poorer classes.

The *aruga* is also a coarse grain said to produce rheumatism, but it is well tasted. The black *jowaree*, of which a small quantity only is sown, has the reputation of being a heating grain.

Pulses Cultivated.

Phaseolus radiatus—Hurrah moongh—Putsa paysaloo.

Phaseolus Mungo—Kala Moongh—Nulla paysaloo.

Phaseolus—Bubberloo.

Dolichos lablab—Anamooloo.

Glycine tomentosa—Cooltee Woolaraloo.

Cytisus cajan—Toor—Candaloo.

Cicer arietinum—Chenna—Shamgheloo.

Oil Plants.

Ricinus communis—Arendee—Ameedea-loo—two varieties—one with a small, the other with a large seed.

Sesamum orientale—Tillee—Nooloo.

Cordage Plants Cultivated.

Hibiscus Cannabinus—Umbarreh.

Crotalaria juncea—Sunn.

Garden Produce.

Tobacco, red-pepper, brinjal, bendy, onions and garlic—sweet potatoe, raddish, *dolichos fabæformis*, &c.

Of the cucumbers, a very important article of diet, there are cultivated or in use the following:

Momordica charantia—Korella.

Momordica diœcia—fruit and root both eaten.

Luffa pentandra.

Luffa acutangula.

Luffa amara—grows wild, used in diet and medicine.

Cucurbita lagenaria.

Cucurbita pepo.

Cucurbita citrullus.

Cucumis melo.

Cucumis sativus.

Cucumis momordica.

Cucumis utilissimus.

Tricosanthes anguina.

There are two varieties of cotton cultivated—one a nankeen cotton, and the other white, solely for home use. There is also a small quantity of sugar grown in the Pergunna of Bellecondah.

The greens used in this Circar are so very numerous, that though some be cultivated the whole will be given in the list of useful plants, according to the natural arrangement which are produced in this Circar.

Plants used in the arts, and for food and medicine, which grow in the Circar of Warungul.

Anonaceæ, *Anona Squamosa*—grows wild throughout the district—its fruit is seldom allowed to perfect itself,being generally plucked before maturity—in seasons of scarcity and famine its seeds are ground and the meal eaten by the natives.

Menispermaceæ, *Cocculus Cordifolius*—a good bitter used in medicine.

Nymphæaceæ—the tuberous roots of all the plants of this family are eaten by the poorer classes.

Papaveraceæ—no opium grown—the *Argemone Mexicana* grows abundantly but neither seeds nor plant are turned to use.

Capparideæ—*Cynandropsis pentaphylla*—wild mustard seeds collected by the lower classes and exchanged for equal quantities of coarse millet.

Cleome viscosa, common—besides other *cleomes*—two or three species of *Capparis,* of which the fruit is boiled and eaten by the natives. The leaves and bark of several of the species are used medicinally. Antiscorbutic.

Olacineæ, *Ximenia Aegyptiaca*—a very common stunted shrub growing on poor soil of which it is an indication; its hard capsules are used in fireworks.

Caryophyllaceæ—two species of *Mollugo,* an infusion of which is used as a fever drink.

Malvaceæ—this natural order, yields plants for poultices, fomentations, &c.; there are many species growing in this Circar, mostly all of which are turned to some account in diet or medicine.

Bombaceæ—the wood of the *Helicteres Isora* is used for making some agricultural instruments. The *Bombax Malabaricum* affords a timber for the construction of the *garim,* an instrument for raising water.

Byttneriaceæ—the *Sterculia urens* yields a gum-like tragacanth, and a wood used for scabbards.

Tiliaceæ—two species of *Corchorus*, common, the tenacity of their fibres is sometimes taken advantage of for the construction of cords.

Two species of *Grewia* are in common use. One arboreous for agricultural instruments—the other a shrub, is employed by the *Dhungurs* for making cages for their lambs and kids, and by others for wattle. The fruit of several species are eaten by the common people and the leaves by animals.

Aurantiaceæ—the lime is common, the citron rare—*Feronia elephantum* and *Ægle Marmelos*—the capsules of the latter used as snuff boxes by the brahmins—the *Bergera Koenigii* in gardens.

Sapindacceæ—*Sapindus detergens*—Soap nut tree and another *Sapindus.*

Meliaceæ—*Azedirachta Indica*—the tree sought after for its leaves and timber.

Cedrelaceæ—*Swietenia febrifuga* and *Chloroxylon Swietenia*—the first common, its bark used by the carpet weavers to dye their cotton thread a dingy red. On the sandstone the latter grows to be a pretty large tree.

Rhamneæ—several species of *Zizyphus*—the *Zizyphus microphylla* is a very troublesome plant to the agriculturist, being very difficult to eradicate.

Terebinthaceæ—some varieties of the mango yield tolerable fruit—the *Buchanania latifolia*, *Boswelia thurifera* and *Garuga pinnata* are all met with, also *Anacardium occidentale* and *Semecarpus Anacardium.*

Leguminosæ.—Besides the cultivated species there is the tamarind growing to a large size, and yielding an important article of diet—*Butea frondosa* commonest of all, along with its congener—the *Butea superba*, it yields the East India kino—not one ounce of which is collected—the bark of both is used as a cordage—the leaves rolled up are used in smoking tobacco. Two species of *Dalbergia*, *Latifolia* and *Sissoo*, furnish hard wood—from the seed of the *latifolia* there is expressed an oil. Five or six species of *Acacia* growing in the Circar yield timber, *Caesalpinia Bonduc*, *Cassia fistula* and the *Cassia absus* from the seeds of which is pre-

pared the valuable eye-snuff called *Chucksoo.* Two species of *Bauhinia*—timber useful for house building and to the cultivators—and their bark, a cordage. The *Trigonella fœnumgrœcum;* seeds of the *Cassia obovata,* used in the preparation of Indigo, and the leaves as greens. The seeds of many of the species eaten in famine—particularly of the *Indigoferæ*—the *Indigofera* from which a coarse Indigo is made and the *Abrus precatorius.*

Combretaceæ.—*Terminalia Catapa,* in gardens, *Terminalia Billirica, Terminália Chebula*—the last two common on the eastern part of the Circar—*Pentaptera tomentosa,* a timber tree; *Combretum ovalifolium;* of this extensive climber use is made in basket weaving, &c.

Myrtaceæ.—*Punica Granatum,* common in village gardens; *Jambosa vulgaris*—bark useful in the preparation of Indigo, &c., and *Baringtonia acutangula* is one of the most beautiful of the forest trees of the Circar.

Cucurbitaceæ.—Besides the cultivated species the colocynth is very abundant.

Portulaceæ—leaves of the *Trianthema decandra,* and two species of *Portulaca* eaten as greens.

Rubiaceæ—two species of *Nauclea* yield timber; some *Gardenias,* three at least, *deccamullee* or *cumbi* gum, so much used in Native medicine, and one or two species afford a fruit edible on being boiled—*Randia dumetorum, Ixora parvifolia*—timber of the last useful.

The *Morinda citrifolia* is cultivated extensively on the black soil for its dye and the *Oldenlandia umbellata,* the root of which yields the *Cherwil* dye, is the most common of the wild plants.

Compositæ—several plants of this family grow, to some of which medicinal virtues are ascribed—more fanciful than real; of these are the *Cœsulia axillaris, Eclipta prostata, Xanthium indicum, &c.*

Sapotaceæ—two *Mimusops,*—*Sideroxylon tomentosum* and the *Bassia latifolia* which grows in the sandstone districts—both seed and fruit turned to account.

Ebenaceæ—*Diospyros melanoxylon,* wood of little value, fruit eaten.

Jasmineaceæ—*Jasminum sambac,* in gardens—*Jasminum trinervii* very common—flowers of all species of Jasmine looked on as

an external cooling application—*Schrebera swietenioides* in the Pakhall and Chelwaee Pergunnas, a hard wood.

Strychneaceæ—*Strychnos nux vomica*—common on the granite hills—*Strychnos potatorum*, rarer.

Apocyneæ—*Wrightia tomentosa*—leaves added to Indigo in the preparation of the dye; very common wood used for making boxes; two species of *Carissa* yield edible berries; *Monetia tetracantha*, one of the most common jungle shrubs.

Asclepiadeæ—two species of *Ceropegia* yield tuberous roots which are eaten by the Natives.

The two *Calotropis* common—also the *Hemedismus Indicus* and the *Sarcostemma viminale.*

Gentianeæ—*Gentiana verticillata*—a common plant gathered by the Natives as a bitter.

Bignoniaceæ—*Bignonia spathacea*, wood used in house building.

Pedalineæ.—*Pedalium murex*—very common.

Convolvulaceæ.—The leaves of two or three species of this family are eaten as greens and reckoned very wholesome—*Ipomæa cærulea*—country jalap—common.

Solanaceæ.—The Potatoe has been no where introduced, although the red soil would suit it well—leaves of *Solanum rubrum* used as greens.—*Solanum Indica* and *Jacquinii* used medicinally—*Dahtura alba* and *fastuosa*, common.

Labiatæ.—*Ocymum Sanctum* and one or two other species of the *Phlomis*, two or three species yield greens under the name of *Tomi; Premna latifolia*—leaves eaten in curries; *Premna tomentosa*—the wood of which is useful; *Grewia Asiatica*, sought for in house building as the white ants do not attack it; *Tectona grandis*, but it does not grow to be a large or valuable timber tree.

Acanthaceæ.—*Lepidagathis cristatu*, used in veterinary medicine, and as a charm, especially by the weavers, to keep off the evil-eye.

Barleria prionitis, leaves yield a blue dye, and are in consequence mixed with the indigo leaves in the preparation of the dye; *Justicia paniculata*, the well known *creyat*, is very common.

Plumbagineæ.—*Plumbago Zeylanica*—bark used as a blister.

Nyctagineæ—Leaves of the *Boerhaavia prostrata* eaten as greens.

AMARANTHACEÆ.—Almost every plant of this family affords edible greens. The *Celosia argentea—Achyranthes aspera* and *lanata Amaranthus polygamus, oleraceus, tristis, spinosus;* some of the Amaranthes are cultivated.

CHENOPODEÆ.—Much the same may be said of this family—the *Basella alba* is in great estimation as a pot herb.

SANTALACEÆ.—*Santalum album*—valueless.

ARISTOLOCHIÆ.—*Aristolochia Indica* and *brateata*, both bitter and medicinal plants.

EUPHORBIACEÆ.—A species of *Phyllanthus* with white fruit which is eaten by the natives, and one of red, of which the branches are used for tooth brushes—*Phyllanthus emblica* very common—*Croton plicatum* yields a violet dye.—*Jatropha Curcas* also the *Cluytea collina*, the wood of which is used for building.

URTICEÆ.—*Cannabis sativa* in gardens.

ULMACEÆ.—*Ulmus integrifolia*—durable wood. *Celtis Orientalis.* Cordage sometimes made of its bark.

ARTOCARPEÆ.—*Ficus Indica*—bark produces cordage.—*Ficus religiosa.*—*Ficus glomerata*—there are others.

PIPERACEÆ.—*Piper betel*—cultivated in small quantity about Comlapoor.

ALISMACEÆ.—Both *Sagittarias* occur—leaves of *sagittifolia* eaten as greens.

PISTIACEÆ.—*Pistia stratiotes* very common in tanks.

SCITAMINEÆ.—Ginger cultivated but not to a great extent and also Turmeric—*Zingiber Casumúnar* grows in the eastern part of the Circar.

MUSACEÆ.—A coarse kind of plantain is grown in gardens.

HEMEROCALLIDEÆ.—*Sanseviera Zeylainca*—very common—a cordage plant used by the *Coonbees*, &c.

DIOSCORINÆ.—Tubers of the *Dioscorea pentaphylla* are dug up throughout the Circar where it is very common.

PALMEÆ.—The date palm is very common, it is tapped at a very early period of its growth and seldom yields much juice after the age of twenty-five years. Mats and cordage are very extensively made from its fronds. The *Tar*, *Borassus flabelliformis*, is the palm that from its frequent occurrence gives a character to the country. The young plants are defended from cattle by thorns

and the more industrious loosen the ground about them once or twice a year by the plough, but in very many cases this is neglected. The *Tar* is said to yield sap for three generations, and to be ready for tapping in ten or a dozen years. The toddy varies with the season and age of the plant. A bad grain year is said to be a good year for the *Kullals.* The trees are sometimes tapped thrice a day. The *Caryota urens* grows to the eastward but it is not a very common palm, it yields a great quantity of sap. Cordage, baskets and fans, are made from the fronds of this palm, as well as from those of the *Tar—Calāmus Rotang*—the rattan is found in Sumtamunnium and the Chelwaee Pergunnas.

PANDANEÆ—*Pandanus odoratissimus*, leaves made into mats.

TYPHINÆ—*Typha elephantina*, culms formed into hoods by the *Coonbees* to protect them from the rain.

AROIDEÆ—Roots of several species eaten.

GRAMINEÆ—Besides the cultivated grains several species of panicum and elensine yield food to the poorer classes—the seeds are swept off the ground by an instrument called *Woorapilly sapa*, the form and manner of which will be better understood by the drawing. A species of *arundo* yields pipes for the shrill music of the religious mendicants. The *Saccharum cylindricum* yields a strong cord in great use among the *Coonbees*—with this their cots are usually corded. A *saccharum* that grows to the eastward furnishes reeds for writing. The *Ischœmum pilosum* grows where there is a black soil—also the useful *harialee (Panicum Dachtylon)* the sacred *Poa*—the *doorb* grass and other species of *Poa*—the *Rottbœllias*, grown in the Circar, are much used for thatch.

It may here be mentioned that the Circar produces no timber valuable enough for exportation. The teak, ebony, sandal wood, satin wood tree, and the blackwood are of short and stunted growth in the granite—and do not attain to any great size in the sandstone.

The *Pentaptera tomentosa* and the *Schrebera Swietinoides* might be found to produce good serviceable timber, but with the teak of the Nagpore forests so near at hand they could never enter into competition.

Agriculture.

The agriculture of this Circar, more especially as shown in the cultivation of rice, is

exceedingly backward; not only when compared with Indian agriculture generally, but with that of the neighbouring country under His Highness the Nizam's dominions.

The rice crops are divided into two. 1.—The *abee* or rain crop sown at the commencement of the rains, and reaped at their close at the beginning of the cold weather. These crops are either watered from wells, or advantage is taken of the early rains that fall on the low grounds. 2.—The *tàbee*, sown in the cold weather and reaped in the hot—almost universally a tank crop.

The dry grain crops are the *poonass* or rain crop answering to the *khureef* of Hindoostan and the *rubbee*. The grains, pulses, and seeds of the ponass are yellow, red, and black *jowaree* which ripen in four months. Indian corn—all the millets and the *Paspalum scrobiculatum*, green *moongh*, *bubberloo*, *anamooloo*, *umberrah* and some gourds, sown among the *jowaree*, also the *sunn*. The *rubbee* includes white *jowaree*, wheat, gram, black *moong*, *toor*, *cooltee*, castor oil; such seeds as ripen with the *rubbee* crops, although sown in the rains, are reckoned *rubbee*.

The cultivators usually content themselves with three ploughings of the rice grounds under a tank—they at first plough the ground twice, and, after the compartments of the field have been prepared by women labourers, the water is let in. When the weeds are sufficiently rotted they plough again—then harrow—and the soil is finally prepared for the reception of the seed by being rendered smooth, and all earthy lumps that it may contain being mingled with the mass. The day after sowing, the water is let off—but on the fourth day after, a little water is again let in—and from the sixth day, they continue watering every second day. The manure used is the droppings of sheep and goats: more care is bestowed when the water is procured from moats—for they then plough five times and use any kind of dung they can procure from the village, and often transplant. Sprouted seed is sown in Vizianugger and Bellecondah Pergunnas and generally in the southern division of the Circar for the rain crop. One rice crop is the rule—two the exception. At Merecondah and in some parts of the Yelgoor pergunna, where the lands are leased for several years at a quit rent, there is some encouragement to cultivate carefully, and make the most of their allotment—and here we find double cropping. When rice is attacked with in-

sects, bats-dung is thrown over the field, and sometimes assafœtida —but more frequently *decamullee* is enclosed in a gourd and buried in the stream that irrigates the rice. An earthen pot whitened, or the skull of a bullock, is set up in the field to avert the all dreaded evil eye. Hunnumaun's protection from evil spirits is invited by offerings of sugar, rice, and flowers—and the wrath of the *Saktis* they endeavour to avert by the promise of a goat. Rather more attention is paid to the cultivation of the dry grains, especially the *jowaree*—for on them the *Coonbee* depends for his subsistence, while the rice goes to pay his rent, satisfy other land dues, and above all his Bunnya creditor. The *jowaree* is sown broad cast, or with the drill plough, after the ground has been carefully ploughed at least twice—but in the stiffer soils, and where there is much grass, sometimes five times. They give the soil a light top dressing with the dust of bones and offal burnt, procured for them by the Choomars. On rare occasions it is manured with cow-dung, and with much anxiety do they watch the growth of a crop which is their sole resource against starvation, and sundry are the appliances, which their ignorance and superstition suggest to render it productive. When the stalks are too red they sacrifice a goat and sprinkle the blood on the field. When too black, bats-dung, and when too white, milk and *dhye,* are thrown on the crop—when worms attack the stem two or three of the insects are rolled up in a cotton wick which when dipped in a mixture of ghee, sesamum, and castor oil is placed on a human skull raised on a stick, and then set fire to—if a skull be not procurable the shell of a land tortoise (the *Testudo geometrica*) is substituted—this last ceremony smacks of the human sacrifice of the Khonds—but the following can be typical only of such a rite now happily exploded. When a very serious blight threatens his jowaree, the *Coonbee* gets up at dead of night, collects five handsful of earth from a *Coomar's* workshop, five from the *dhobees* ghat, and five from the place where a corpse has been consumed ; these he mixes together and forms, as well as he can, a human figure on the ground, the earth of which is then thrown on the field. The charm will have no effect if any one should be cognizant of it.

For the Indian corn the ground is prepared much in the same way as for the *jowaree*—but it is more frequently manured with cow-dung, and the seed is planted by the women in the drills form-

ed by the drill plough, though not dropped through that machine.

This mode of sowing is also adopted in putting down cotton and horse gram. With the Indian corn, as with the *jowaree*, castor oil and some of the pulses is sown. The Indian corn is reaped in three months. For the pulses, particularly for *moongh*, there are several ploughings.

Wheat, of which a small quantity is cultivated in the Circar, is grown in gardens and irrigated.

Little care is bestowed on the cultivation of the millets—they are not manured, and two ploughings are deemed sufficient. For *boora* and *pota sama* a mere clearing away the surface weeds is all that is thought of. The *paspalum* to have a good crop must be sown on a virgin soil. All kinds of *jowaree*, with the exception of the black, are sown with the drill plough, if the *Coonbee* can command one—the millets, *sesamum*, *moongh*, &c. are scattered.

The *jowaree*, castor oil and Indian corn are weeded at least once during their growth. White *jowaree*, *moongh*, gram and *toor* are taken up by the roots—the other grains and pulses are cut down. When the plant is young and tender—both of grains and pulses it is subject to be attacked by grasshoppers, for which no remedy is known: destruction by locusts is rare. When threshed and housed, *neem* leaves are mixed with the seed to protect it from the weevil; when attacked by that insect there is no other remedy than exposing it to the sun's rays. The grain is usually stored up in wicker baskets made of the *Vitex Negundo*, *Grewia Asiatica* cow-dunged, but when intended for seed it is kept in large earthen vessels. A certain rotation of crops is observed in the dry grain cultivation.

On the Red Soils. 1st year yellow *jowaree*. 2nd year castor oil, *moongh*, sometimes cotton. 3rd year yellow *jowaree*, or some of the millets. 4th year fallow. 5th year fallow.

On the Black Soils. 1st year—a *rubbee* crop, white *jowaree* or black *moongh*. 2nd year a *poonass* crop, a millet or yellow *jowaree*. 3rd year a *rubbee* crop, castor oil, *moongh* or cotton. 4th year *ponass* yellow, red, &c. jowaree and

toor. 5th *rubbee*, and so on for ten years, when the ground is allowed to fallow for two or three years.

The fallow ground is neglected, which is not of much consequence in the black soil—but the red gets speedily covered with low growing shrubs and bushes—the *Cassia auriculata* and *Zyzyphus microphylla* shrubs, that both exhaust the soil and cost much labour to eradicate on the ground being again cultivated—but this, to tell the truth, the *Coonbees* seldom do, contenting themselves with burning them down and leaving the roots. Although perfectly aware of the benefits of a dash of lime in the soil they never think of loosening the stiff loams, or fertilizing the red soils by that application. The garden cultivation presents no remarkable feature save its slovenliness; even from tobacco they occasionally withhold manure—although both for it and red pepper cow-dung is generally used—but the employment of this substance for fuel materially interferes with its use as a means of enriching the ground. A small quantity of *pawn* is cultivated at Camlapoor.

The size of farms is estimated by the number of ploughs. A *Coonbee* with four ploughs is reckoned well conditioned—two ploughs is the ordinary number belonging to one cultivator—but he is deemed very poor if he can only muster one—eight ploughs are looked on as a large farm, seldom the tillage of the mere *Coonbee*, but of the Zemindar, *Putwarree*, rich Brahmins, &c. who may possess double the number or more. The cost of setting up a couple of ploughs is estimated at a hundred rupees. Rupees 50 for two pairs of bullocks with their harness, and rupees 50 for the price of implements, seed, and for his subsistence till his crop be mature. Twenty returns of rice is looked on as a fair crop, and no more striking fact can show what unskilful agriculturists they are. Much more, however, is looked for from their dry grains, when, if the season be very favorable, 80 returns are expected, but more commonly from sixty to forty is as much as they reap. The yellow *jowaree* is very productive, but the Indian corn, if the land has been properly tilled, exceeds all in productiveness—a quarter of a *maund* sowing producing two to one and a half *kundees*. A *kundee* of yellow *jowaree* from a quarter of a *maund* of seed is regarded in the *poonass* as a very good crop—and in the *rubbee* the same quantity of white *jowaree*,

from double the quantity of seed, is esteemed a fair return. In the *rubbee* the seed is sown more thickly and *toor* usually is grown with it.

Expenses of the Tabee Rice Crop and its return to the Coonbee.

Seed one Maund.				*Produce one Kundee.*				
Price of seed, ...Rs.	2	0	0	To the Balowbek,...............		6 Consoos.		
Women's labour,......................	0	14	0	" Government,...... 9 M.		1 "		
For watering,.........................	0	8	0	" Putwarrees, ...		2 "		
Price of labour ploughing, hired labour,................................	2	8	0	" Dorwa, Havildar, Patell, &c..................		1 "		
Other expenses, poojas, &c.,.......	0	2	0	8½ Maunds remain to the Ryot, at rupee 1 a Maund, Rs.		8	8	0
Rupees...	6	0	0	Deduct Rs.		6	0	0
				Remainder Rs.		2	8	0

It will be observed that he has to pay double the price for his seed that he gets for his produce, but this is owing to the care necessary to be taken of seed corn, which is always presumed to be of the best quality : besides, the Coonbee is usually in debt to the Bunnyah, who affords him the seed.

Tenures.

The first and most common tenure is the *buttaee* or *adhenath*, where the government and cultivator divide the produce equally after the deduction of six consoos on the kundy (7½ per cent.) for the Balowbek, with the exception of the Putwarree who receives two consoos from the ryot's share, and the zemindar, havildar, dorwa or patell one consoo; when the land is manured and irrigated from a well, the government demand is one-third, two-thirds going to the ryot with the usual deductions. In the *poonas* when lands are tilled under this tenure eleven parts go to the ryot and nine to government; and in the *rubbee* eight parts to the ryot and twelve to government with deductions as before. In sowing grain if the seed is advanced by the Bunnyah the produce is divided into three parts—one for the ryot, one for the Bunnyah, and one for government.

2*d Muckta cowl.*—This is simply paying an annual quit rent for an allotment of land to be held for a certain period, seldom under ten years. It is on this tenure that garden lands are cultivated, the rent of which per beegah varies from four to seventeen rupees; but the common rent for red soil is rupees 2 a beegah, and for the black rupees 2½ to rupees 3 and 4, all depending on the quality of the soil.

Istawa cowl.—For taking in waste lands an increasing rent for the first three to five years when it becomes fixed red soil is on this ground rented.

1st Year ½ rupee per beegah,	a shorter period is allowed for the black soil.
2d Year 1 „	
3d Year 1½ „	1st Year 1 rupee per beegah.
4th Year 8¾ „	2d Year 2 „ „
5th Year 2 „	3d Year 3 „ „

Ijara cowl.—This is when a native of substance rents a whole village from government and sublets it, settling himself with the government, when the middle man is any one but a zemindar, the cowl is called *ijaree*, when a zemindar is such then it is called *surbusta.*

Bykarree cowl.—When the inhabitants of one village rent a portion of the land of another, this is a tenure for a year and is given on favourable terms, as the Pykarrees are supposed to lose time and incur fatigue by the distance they have to come. It is a tenure liable to be abused, as frequently the inhabitants of a village leave the lands of their own village untilled if they think they can rent the lands of another on more favourable terms.

Nagur cowl.—Plough tenure usually from three to four years and granted only for the cultivation of dry grains, as much as Rs. 15 a plough is occasionally paid for this tenure. It is also liable to objection as the ryot is apt to cultivate in a slovenly manner that he may break up as much surface as he can, and it is disadvantageous to government, as the ryot may keep three pairs of bullocks for his single plough.

Koolharee.—The hatchet tenure; this exists among the Coorwars of the Pakhall, &c. purgunnahs. It is as much as one man can clear with his hatchet; from 4 to 8 annas is the rent for each hatchet.

The quantity sown is the ancient Hindoo measure of land, and in the *buttaee* tenure it is still in force. Yet the word beegah is constantly made use of in enams, to temples in meeras lands, and in some of the tenures; and that a fixed beegah was established throughout the country is placed beyond all doubt, by a linear measure cut in a rock adjoining a temple in the neighbourhood of Camlapoor, with an inscription in Teloogoo, set-

ting forth that this measure is the length of sixteen cubits, and that of this ten go to measure the side of a beegah—in other words the beegah consists of twenty-five thousand six hundred square cubits, or six thousand and four hundred square yards, which is just the Madras cawney, or one acre, one rood, eleven poles and seventeen and a quarter yards; one plough, it is said, is capable of tilling two beegahs at a time. That is, two beegahs in the *poonas*, and two in the *rubbee*, or two in the *abee* and two in the *tabee;* but this is rather a rough estimate, as much must depend on the quality of the bullocks, and also their number. Six coonsoos of rice are looked on as one beega's sowing, and another measure more rude is applied to land producing dry grains. As much land as a man seated on a bench can scare the birds from, is said to be the labour of a plough, or two beegahs, but this would seem to be very much over-rated.

Jagheers.

Enam lands are constantly classed with jagheers. In this circar there are three killadaries, those of Warungul, Zuffergur, and Thatconda, with two villages in the first, one in the second, and one in the third, nominally for the support of the forts, but in reality for the subsistence of the killadar. The killadar of Warungul is a man of family, connected with the Nizam by marriage; he has a very indifferent reputation; his revenue is said to be Rupees 5,000 and upwards a year.

The killadarship of Zuffergur yields about half that sum to the killadar Kyunt Yar-jung, and Thatcondah Rupees 5,000 to Kajan Allikhan.

The Nuwab Soorajool Moolk holds pendant with four adjacent villages as his personal jagheer for subsistence.

Balapursad, and Rajah Nauneck Buksh, sons of the late minister Chundoolall, held jagheers, as they are called, but without being subject to the entertainment of troops—in fact enams, the first to the extent of Rupees 38,820, from sixteen villages in the talook Kowlapoor, pergunna Hussenabad, and from twelve in the talook Merrecondah, a few miles south of Warungul. The second Rupees 15,203, from forty-one in the pergunna of Yelpcondah. Both these enams were considered forfeited soon after the resignation of their fathers in 1843, and their revenues have been since collected by government.

To Jawoodood Dowla, a nobleman in the city, there has been

assigned a small personal jagheer of Rupees 4,600 in the pergunna Yelpcondah, and to another man of family Meer Ashuck Hoossain Alle, a village called Woolundee in the same pergunna, yielding Rupees 2,410. Two peerjadas have enam villages—the one, Idutshah Durwesh, has four in the Havellee pergunna, which yields him Rupees 3,618, and another Hoossain Badshah has five villages in the united pergunnas of Kotaguttoo, Katachpoor, yielding Rupees 4,812. The kazeehirky has two villages assigned him yielding Rupees 1,505, and a lady Luteef Begum, a small village called Luteef Begum, in pergunna Yelpcondah. All these sums are according to the koolkamil assessment, and their accuracy is not to be relied on.

Throughout this part of Telingana the village system prevails, but there does not seem to be that staunch adherence to the chief village officer and his family, the Patell, which exists elsewhere, as in Malwa, where a Patell to a village is as necessary as a queen bee to the hive. The simple usurpation by force or fraud of the Patell's rights by the Deshmooks and Deshpundyas does not thoroughly explain this, for at one period Malwa was the most lawless country in India, where such rights would have been usurped without scruple if they could have been maintained. A concurrent cause must therefore be sought for, which will explain how the ryots acceded to the spoliation of their chief, and it may be found in the necessity that exists in Telingāna, on the occurrence of a bad season, of the population abandoning their villages to seek sustenance elsewhere. Owing to this the tie to their patell would necessarily be relaxed, and the Deshmookh or Deshpundya would be regarded as the village, as well as the district head, and would be tacitly permitted to assume the rights of the patell on performing his duties.

Zemindars.

Surdeshmookh and Surdeshpundya. It has been already mentioned that one family of Surdeshmookhs and one of Surdeshpundyas existed in the circar of Warungul.

Their supremacy however is nominal, as neither the one or the other exert any controul over the class of Deshmookhs or Deshpundyahs, or derive any pecuniary advantage from their position. It may be presumed however that such claims once existed, not so much from the present Surdeshmookh's attempting to revive the

dormant rights—as from the Surdeshmookh of Elgundel deriving a certain pecuniary grant from his position independent of his dues as a simple Deshmookh.

The present Surdeshmookh is of the Coonbee caste—a turbulent unscrupulous man, and likely enough to give trouble to a weak Government. His name is Venkut Narsinhá, and he shares with a brother, Yermojee, the rights of Surdeshmookh—he resides at Atmacoor.

The Surdeshpundyah, Mullya by name, is a Brahmin, and has the unenviable fame of being the worst Zemindar in the circar. He lives at Mutwarrah, but the other members of the family live elsewhere.

Deshmookh and Deshpundyah.—These are named indiscriminately zemindars—the former are usually Coonbees or Yelmas, the latter Brahmins, but the Zemindars of the Hussenabad and Cotacundah pergunnas are Brahmins, and exercise the rights and receive the fees of both Deshmookh and Deshpundyah. One of their ancestors being Peshcar to Tannah Shah, the uncle and Dewan of one of the last of the Affghan race of Golcondah kings, had this grant accorded to him in consideration of his services—but in fact the concession is now of little use, as, by mutual agreement, the Deshmookhs and Deshpundyahs have yielded up their rights to each other, on condition of being allowed to hold each his own villages, independent of the interference of the other either for profit or control, thus obliterating all traces of their original connection. The fees received by them are five per cent. on the revenue with two beegas of land at each village, which may be reckoned five per cent. more ; they have also the care of the Sadar Khurch, an allowance to each village from Government of five per cent. on its revenue, for the repair of tanks, cutcherry expenses, alms to beggars, and allowance to dancing women called Doombarnees. They have besides claims on the produce of the date and palmyra trees, a share in the town, transit duties and local duties ; they are the head of the police, and being accountable to Government for all murders, robberies, and other violences perpetrated in their several domains, must proceed posse comitatus to the apprehension of the criminal. They enforce the decision of punchayets, collect the revenue of their district—in short, exercise the functions of justice of the peace, sheriff, and land steward to Government.

The character of these functionaries in this circar does not stand high, and with some exceptions they are, especially the Brahmins, the objects of much merited odium. To quarrel among themselves, to squeeze as much out of the ryots as they can, and to defraud Government, are the great end and aim of their existence, which they pursue without much shame or remorse. Since the time of Sir Charles Metcalfe they have been restrained by European superintendence till within the last four years. On their emancipation from which, that they have at least relapsed into their old habits of lawlessness, the following incident will show, while it will illustrate fully to what a crime an ignorant Government like the Nizam's may be unintentionally privy. A feud of some standing existed between the Surdeshmookh Venkah Narsinhá, and the Deshmookh of Pakhall, Dhurm Rao, a Yelwar. The character of the latter was that of a bold fearless man, not certainly tormented with a very tender conscience, who had been outlawed, proscribed, and driven to seek refuge at Bustar in the very heart of Gondwanah, but rather for the crime of his father than for any misdeeds of his own, his acts being retaliatory rather than aggressive. He had however returned, made his peace with the Government, had been reinstated in his patrimonial rights, and had for several years effaced, by correct conduct, all suspicions of disloyalty. At the end of the hot season of 1844, not one year after European control had ceased, the Surdeshmookh obtained a warrant from the Hyderabad Government to the Naib at Hunnumcondah, (procured, it is said and believed all over the country, by a bribe of rupees 10,000 to a wretched parasite of the court, of the name of Balmoocund,) setting forth that if Dhurm Rao appeared in open rebellion he might be put to death. Armed with this he prevailed on this officer, no very unwilling instrument, to aid him in accomplishing the slaughter he meditated. To avert suspicion a nautch was given at Hunnumcondah from which the parties chiefly concerned withdrew at an early hour of the night—they had already laid their plans, and before day had dawned the village of Dhurm Rao in the vicinity of the Pakhall lake was surrounded by Government troops under the Naib, and the police of the Surdeshmookh under Venkat Narsinhá himself. Their victim, who was sick at the time, and thinking of anything but treason or rebellion, attempted to escape, but in vain. He was run through

with a spear, and the murder was speedily accomplished. To give as legal a colouring to the atrocity as possible his head was fixed on a spear and paraded through the streets of Hunnumcondah.

Surmoonewar, Boputtee, the chief of the Corewars, a race of savages inhabiting the jungles about Pakhall. To this office were attached certain rights exactly similar to black mail over certain districts estimated at one per cent. on the revenue—but through the misconduct of the Boputtee and his people and the resistance of the Zemindars, have caused these to be forfeited in a great measure. He derives however some revenue from rents, and in a bad year when the Pakhall lake shrinks, he is entitled to crop the dry margins—and it is on such occasions that the Government officers manage to make him pay up his arrears of tribute, but he has a very decided repugnance to fulfil such claims, and evades them in every way he can. Some of the wretched hamlets of his country send in as their contributions speaking mynas, red squirrels, and jungle produce of all kinds. Although looked on as a bad subject his rights are probably more ancient and certainly as well guaranteed as many of his brother Zemindars of the plains. He affects caste, and does not eat beef as other Corewars do.

Besides the claims accorded by government the Zemindars levy on their own account certain *puttees* of the nature of aids in the feudal times.

1st. *Shadee puttee*—On the occasion of a marriage in any of their families.

2nd. *Boordee puttee*—for a death, and one for a birth in the family.

3d. *Suffer puttee*—for defraying the expenses of a progress through their own domains. These taxes fall exclusively on the cultivators and artisans, they are not raised by a particular assessment on each individual, but the village is arbitrarily assessed, and the heads of the village who are exempted from any payment have the care of raising it. These are seldom paid with good will, and when exacted by an unpopular Zemindar are hateful. A story current among them will illustrate this. A wicked Rajah who ruled over a part of the country and whose capital was at Chandragiri devised a *puttee* of a new kind. The breasts of the women were to be measured, and the measure was to be filled up with coins. The

tax-gatherers came to the house of a dhobee who was absent, and proceeded to execute their orders on his wife who had remained at home. The woman, indignant at the treatment she met with, dashed out her infant's brain against the washing stone, and then slew herself, after she had cursed the Rajah and imprecated desolation on his house. The city became a wilderness, and the wicked Rajah's family was destroyed, and to this day may be seen the blood and brains of the child on the margin of a tank.

Patell.—In very many villages of this circar this office has become extinct, yet in the Surdeshmookh's districts they are still to be found; their rights are mostly in the hands of the Zemindars and Dorwa (the Teloogoo word for Mugadum) and their functions performed by them.

The nature of the office of *Dorwa* or *Mugadum* and his rights will be fully understood by the sunnud in the Appendix.

Putwarree.—This functionary has withstood all vicissitudes—and he, not the patell, may be regarded as the real key-stone of the village community. He is invariably a Brahmin, and must be capable of reading and writing. His grain hug has been noted, his meeras land varies much in extent, but may be taken at two beegas of rice ground and two beegas for dry grain, but he is commonly the richest man in the village—tilling much more land than his original gift, which he, being of the Khooshbash, obtains at a more favorable rate than the mere ryot. In Kusbas he gets a portion of the garden produce called *poorjee*, also a small fee from each shop when fairs take place. He has a share too of the produce of fruit and palm trees. A very good understanding usually exists between him and the Zemindar who favors him in all disputes, and if differences between them spring up, they are of the nature of lovers' quarrels; indeed the cunning of both leads them to affect animosities to give them facilities for cheating the revenue officer.

It may be here mentioned that the meeras lands of this and of the other district and village functionaries may, through misconduct, or from incapacity of their possessor, be taken from them by Government, which in this case bestows them on a member of the family more loyal or more capable. Meeras lands are seldom sold, indeed it is questionable if any such sale is legal, but they may

be mortgaged for debt, in case of the proprietor going on a pilgrimage, or where a widow with a young family has the right to them, but is incapable of exercising it satisfactorily.

The other hugdars, among whom the six coonsoos of grain are distributed, are numerous, and the proportion of grain to each is by no means constant. In most cases Government or its agent comes in for a tolerable remainder after the share of the rightful owners have been adjusted, but the hugdars also get lands on favorable terms, Government exacting less rent from them whether of money or grain than from the ryot.

Burhaee, (carpenter,) seems an essential member of the village community, but even his hugs vary: two pylees of grain in the cundy would seem to be the proportion he usually receives. He gets also presents of grain from the Coonbees for doing extra work. The *Putwarree* is sometimes liberal enough to present him with a cow, and the Government with a piece of land or a well, with the right to cultivate around it.

Lohar.—Receives two pylees and has gifts like the carpenter. The other three of the *Paunchbaee*--the tin-man, stone-cutter, and goldsmith have dropped out of the village hugdars—and the last is even reckoned among the rent-payers in kusbas when only they are found, but he gets a certain per centage for shroffage. The *Sungtrass* may be looked on as extinct, for the miserable hut builder can surely not be the descendant of the gigantic race who, in the days of old, were so strong as to be able to squeeze oil from the sesamum by the mere force of their clenched fists.

The *Paunch-baee* wear the sacred cord, and have particular marriage ceremonies, which are gone through with a privacy unknown to other castes. It is likewise considered unlucky to meet a member of the brotherhood in the morning, as they are the manufacturers of deadly weapons.

Yellawar.—He is often a low caste man but not necessarily so, indeed he may be of any caste except a Brahmin, a *Yelwar* is a Coonbee. At Hoosain-purty he is a carpenter. In the smaller villages he is at once boundary marker guide, and water distributer, for which he receives four pylees of the *Balowteh* allowance, but in the larger villages his functions are divided between two or three or even more, in which case so much as six pylees, or even more, are allowed, the scout receiving the largest share.

The *Dhobee* gets one pylee besides presents, on the birth of a child, from the cultivator. In the Kusbas he is reckoned among the rent-payers, he cowdungs the cutcherry and sweeps the inside, the Tullarewar or Dher sweeping outside.

The *Hujjam* gets one pylee and small presents on the occasions of weddings.

The Coomar.—An important member of the village, all castes, save Brahmins, eat from his hands; besides his occupation of pot-making he makes the *lares* and *penates* of the lower castes, and performs poojah, &c. to the *Saktis*, which are not acknowledged by the Brahmins, for which he receives two annas each time. His allowance is one pylee. In the larger villages he is a rent-payer.

Chumar.—Receives two pylees. The several priests, the Brahmin astrologer, the *Jungum*, the *Byudlewar*, the Poojarree of the lowest castes, the *Ayawar*, the priest of Vishnoo, the tom-tom beaters or *Tumbree*, each receives a pylee, and also the fakeer where there are Mahometans. The *Dhers* and low castes who act as Pyadas receive a proportion varying according to their number, and the Dhungurs a portion for the dung of their cattle and sheep. The *Doombarnees*, dancing women, also come in occasionally for a share.

Brahmins.—They are chiefly Sunkaracharrys; followers of Siva and the Saktis, there is little learning among them; the astrologers are reckoned weather-wise, although their prognostications often fail—they also cast nativities and calculate eclipses with some accuracy, there exists two sects of Vaishnava Brahmins. Ramanuj and Madwacherry, the last are Hunnuman's priests, and are said to live luxuriously. In the Appendix is given an account of some of the enams of the temples, but these, particularly the money payments, are often evaded by the Mahometan Naibs.

The Brahmins employed in secular pursuits are of the two sects, Ramanuj and Sunkaracharry; no Brahmin, whether secular or of the priesthood, tastes fish or flesh, but for this they make up by drinking ghee, milk, and using highly azotized spices in their food—they drink toddy but not openly; the majority snuff, but some smoke tobacco; very few Brahmins are actually tillers of the soil.

Yelmees.—The Rajpoots of Telingana, although their pretensions to fill the place of the Shatryas are sneered at and denied by the Brahmins, are a manly race, fond of the chase, and, from veiling their women, are reckoned among the Khooshbash. Some Deshmookhs are of this caste, the Sumtamunuyum and Pakhall Deshmookhs being both Yelmees. They are cultivators and soldiers, but few enlist into the service of the Company or the Nizam. As to their origin, they were in all probability the fighting class of Telingana before that country became Brahminical, and they need care little for the Brahmins denying them the rank they covet, as the similar claims of the Rajpoots are rejected by the same authority. They are all followers of Vishnoo. There are a few Rajpoots about towns, usually in the military service of Government.

Mussulmauns.—Most of these are Government employés, but the carpet weavers of Mutwarrah are all Mahometans, and very bad specimens of the faithful they are, being drunken, turbulent, and lazy. Some cultivate the lands of the Peerzada, and a few are farmers on their own account, and *dorwas*, and some are tradesmen. The butcher being universally a Mahometan. Brahmins, Yelmas, and Mahometans are of the Khooshbash, and have certain remittances of rent from Government allowed them, as from the circumstance of keeping their women behind the purdah, they are denied their aid in their labour ; this allowance, or *mooaf* as it is called, varies in the grain rent from one and half maund to two maunds in the cundy. As before stated they are not subject to puttees.

Coonbee: (*Capulloo*—in Teloogoo.)—Of these there are no less than seven different sub-castes, who neither eat together nor intermarry, existing in this Circar alone. But there is said to be in Telingana as many as twelve.

1st. *Mootat*, 2d. *Goreewar*, 3d. *Luckamurry*, 4th. *Pakenat*, 5th. *Cordiewar*, 6th. *Gonewar*, and 7th. *Chutteepoowar ;* the first four are reckoned the superior classes, from the circumstance of some Deshmookhs belonging to them. The three last are the more temperate, and are said to deny themselves flesh and toddy. The Chetteepoowar are Lingayets.

The Coonbees are very industrious, although social evils have rendered their labour of little avail in elevating themselves to a condition superior to that in which they were born. The sowing

and reaping seasons are their busy times, but the hot weather is by no means spent in sloth, they then cut down wood for the repair or renewal of their implements, burn for charcoal, make straw ropes and collect thorns. The women are truly their husbands' help-mates, they prepare his food, weed, plant grain, clean cotton, grind corn, and, in the absence of other employment, ply busily the wheel and spindle. Old age is respected among them and carefully tended, and if we have to blame that inveterate practice of uttering without remorse the most unblushing falsehoods respecting their condition, there is much to laud in their industry, patience, and good nature. They are not so active or physically strong as the Mahrattas, but in intelligence they are much on a par with them, and in politeness superior to that rude and unmannerly people. The principal item of their extraordinary expenses is their marriages, seldom defrayed for less than a hundred rupees, though it is possible to be got over for half the sum. At births a rupee, or its equivalent in grain, is given to the dhobee, the same to the midwife, and from two to four annas to the Brahmin who casts the nativity. The purification feast cost them a couple of rupees. The Deshmookhs of this caste veil their women.

Beljewars.—Also cultivators, especially about Purcull, where they are to be found in the greatest numbers. But they are also shopkeepers, sell drugs and tobacco, have property in cattle, and practise medicine. They are all Lingayets; Jungums are very frequently from this caste.

Dhungurs.—Of these are twelve sub-castes—1st. *Yerrah Walleroo*, 2d. *Pakenat*, 3d. *Putra*, 4th. *Pooja*, 5th. *Paddameeta*, 6th. *Peya*, 7th. *Gumpa*, 8th. *Carne*, 9th. *Mittee*, 10th. *Moodeta*, 11th. *Mooda*. There is yet another; they are distinguished by the difference of the ornaments of their women and by their dress, and, like the different sub-castes of Coonbees, do not eat or intermarry with each other. The Yerrah looks on himself as the best caste Dhungur. The Dhungurs are reckoned among the rent-payers in the larger villages. Their contribution to Government varies much according to season and locality. When hired by Zemindars to tend their cattle the Dhungur gets ten rupees a season, a cumlee, some tobacco, a pair of sandals, and the milk of a cow.

The breed of cattle of this part of Telingana is peculiar. They

are a small hardy race of a white colour, the tips of the tail being black. The cows calve at the beginning of the rains; if the calf be male it is allowed the whole of its mother's milk, but if female the parent cow is milked to about half a seer, or about the half—a seer a day being the average quantity given by a single cow, although a seer and a half may sometimes be obtained. In the hot season herds of this breed of cattle collect from this and the neighbouring Circars at the Pakhall lake on account of the abundance of grass there. Several of the instincts and dispositions of the wild animal, dormant rather than extinct in the domesticated state, show themselves; they keep together for mutual defence, rush from pasture to pasture in a body, and at night time each herd forms itself into a square, to keep off tigers, which seldom venture to assail the body when so prepared, but are obliged to content themselves with the waif and stray. The proprietors of the several herds, chiefly zemindars, pay a rent of ten rupees a season to the deshmookh of Pakhall for each.

At two years of age the males are gelt by breaking down the testicle or destroying the cord by a sharp piece of bamboo run through and through. This cruel operation seldom proves fatal. From twenty to twenty-four rupees is esteemed a fair price for a pair of these bullocks. The cows after giving four or five calves are sold to butchers, who come from Hyderabad or reside in the larger villages, for three or four rupees. One draught bullock of this kind measured in height 4 feet 2 inches, length of back from between the horns to the root of the tail 6 feet; another measured in height 3 feet 9 inches, length of back 5½.

At Muncherla, in the *Havalee* pergunna, Feraputty, and at Yellunda, a village in the jagheer of the killadar of Warungul, there is a breed of bullocks very much resembling the Berar. The Telingana bullocks are used chiefly by the cultivators, the Benjarees buy them occasionally, but prefer the Berar bullocks as stronger.

The goat and sheep present no very striking peculiarity, their price varies from twelve annas to a rupee; two kids are common, but lambs come usually single.

The buffaloe is of a very inferior kind, yielding two or three seers of milk a day only, price varying from 5 to 10 rupees; they are sometimes used for draught; the buffaloe calves in autumn.

A disease similar to cholera in some of its symptoms attacks

stock—cows attacked with it occasionally recover, but buffaloes never; little or no medicine is used, as the disease is reckoned the direct chastening of the *Saktis.*

The cow-pox also prevails in October; excessive fat too is regarded as a disease.

Stock is also subject to be attacked by worms and by a disease of the liver—the liver fluke? Although rather out of place it may here be mentioned that the ponies of this Circar are miserable little animals, and the donkies the usual degenerate race of the Deccan.

There is a head Dhungur who settles with government, mediates in caste disputes, and carries out the decision of punchayets under the Zemindar. Telingees, called also Munnoowars from a degrading tradition of their origin; that this low class should give name to the country is parallelled by the same thing occurring in Gondwanah; they are cultivators, and labourers; they are protected by the Yelmas.

Coolies.—This caste hangs loose on society; they employ themselves in bringing in jungle produce, fruits, roots for food, and medicine and honey, assist in the manufacture of iron, act as Pyadas; in troubled times they are robbers, and at all times thieves and drunkards. The Telingana bearer, who is also a fisherman, is of this caste. The coolies rent from year to year the tamarind and mango trees from the heads of villages at half their produce, or a money rent.

Dhers.—Are similar to their brethren in other parts of India; they are pyadas.

Yellawars.—As Oopurwars they cultivate land—and as Beldars dig wells and clear out tanks.

Yerkullwars.—This is a nomade tribe who live in huts made of reeds, or of the leaves of the palmyra tree, and subsist on the flesh of swine, game, and carrion, and a little grain they may get in barter for the mats and baskets they construct. They snare birds with bird-lime, and they have a small breed of dogs, with which they kill hares. They kill most of the dogs when young but retain the bitches, to which, when they are intended for hunting, they give a certain root that renders them barren; they are a slender bodied animal, of an active make, but with an ugly heavy head. Brahmins will not approach them, but the Jungum is more pliant, and on the occasion of a death, for a present of some grain, he attends

and blows his conch. Their marriage ceremonies consist in a head-man whom they elect for the occasion and place on a throne of turf, putting rice on the heads of the young couple and uttering some mystic words; a pig is then killed, the flesh is cooked and eaten, and ample as their experience must be of the qualities of every kind of flesh, they are unanimous in declaring that pork is superior to all. They then jump about, beat their bellmetal vessels, and the whole concludes by the whole party male and female getting drunk. One of their customs is very peculiar. On the occasion of a birth the husband is looked on as the object of compassion, and is carefully tended by the neighbours as if he and not the wife had been the sufferer. Like all vagabonds they are regarded with suspicion, and with some reason, as they affect to possess a divining rod in the shape of the frond of the wild date, by which they may discover on the outside of a house where property is placed within. Instructed by this, and perhaps by some more certain information, they have been known to dig under the wall of a hut with their long curved knives, and abstract what they found inside. Although despised as a low carrion eating caste, the ryots do not hesitate in cases of sickness to consult them. Then the divining rod is produced, a Yerkullwar woman holding one end while the other is given to the person seeking advice, a long string of words is rattled over, the result of the disease foretold, and the particular shrine is indicated where an offering is to be placed, or the offended *Sakti* named, whose wrath is to be appeased by sacrifice, their peripatetic life giving them an extensive local knowledge of temples and holy places. They pretend too to a knowledge of medicine, and a composition of the bark of some tree, the name of which they will not reveal, powdered and formed into cakes, is in the pouch of every Yerkullwar as a remedy against snake bites. They speak a corrupt Tamool.

Woodeeawars.—They differ little in their customs from the Yerkullwars, and live in the same kind of dwelling, but they wander less, and sometimes acquire some little property in cows and buffaloes. They are employed in carting stones, making mats, digging wells, and clearing out tanks along with Beldars; they receive for clearing out sixty kolas of length and one kola of height and breadth of mud, about 120 cubic yards, two kundees of rice and two rupees, but a portion of the grain is claim-

ed by the Putwarree. Their curse is dreaded by the Coonbees who sometimes earn it by cheating them of their dues. They entertain a deep animosity towards the Dhungurs. The shriek of the jackall, when at their evening meals, startles and alarms them as a bad omen, and they even cast away their food on hearing it. They speak Teloogoo.

Corewars.—This is a savage tribe inhabiting the sand-stone hills about Pakhall and the country towards the Godavery; they are the subjects of the Boputtee, but eat beef and are not acknowledged as Hindoos; they are capable of great fatigue. Save a few balls made up of the flour of the *mallwa*, and tobacco, they go long journies without any other sustenance.

Mahrattas.—Mahratta emigrants are numerous in the western part of the Circar, to which they came some thirty or forty years ago. They have introduced into Telingana white *jowarree*, black *moongh*, and the sweet cucumber. Their lands are rented on the *Istawa* cowl, which after a few years becomes a fixed rent. They live in huts of wattle and dab which they can easily move to another spot, when, from caprice of their own, or breach of faith on the part of the Zemindar, they choose to do so. Their Putwarree is a Teloogoo Brahmin and their artizans are Teloogoo, but their head man is invariably a Mahratta, and he gets for his trouble a certain portion of land rent free. They are considered good agriculturists, and are sober and temperate, but being strangers, without any feelings of local attachment, they frequently, without much cause of offence, shift their quarters. They eat more bread than the Telinghee Coonbees, and the fruit of the palmyra tree is particularly relished by them.

Shopkeepers and other Tradesmen.—These are all regarded as on the Mooturfa, and pay a money rent to government in the large villages where they usually congregate, with the exception of the Bunnyahs and Kullals who are found in most. The chief of these is the Bunnyah, who, besides being engaged in the retail of goods of every description, lends money to the ryots on the guarantee of the Putwarree. The interest to be paid is $1\frac{1}{2}$ per cent. per month, but they are more frequently paid in kind than in money. Thus the Coonbee, of his crop, reserves exclusively for them, *sesamum*, castor oil seed, gram and *moongh;* the Dhungurs always repay in kind; and the Kullal, for fifteen gundhas lent, such is the mode of

their calculation, pays nineteen at the end of the year, very nearly eighteen per cent. The Telingana Bunnyahs are not, it is said, so greedy of gain as the Marwarree, or so merciless in exacting the capital and interest at the appointed time, whatever may have been the mishaps of the debtor; but sufferance with a debtor's delay is not the badge of the tribe, and they unscrupulously seize and sell the whole property of the wretched Coonbee, to his wife's ornaments and his last cooking pot; the poor creature being reduced to misery, and compelled to content himself with rags, earthen pots, and a precarious subsistence as a day labourer, and it is a common saying among the people that of all classes it is most difficult for a Coonbee to regain his position. There are Marwarrees in the Circar on their own account, and agents from parties at Hyderabad. The Bunnyahs are of three classes, followers of Vishnu and Siva and Lingayets.

Kullals.—The toddy drawers. The rent of toddy trees is included in their contribution. But a better idea will be given of the several trades and of their payments, by a table showing the moturfa payments as they exist in the town of Hunnumcondah.

Moturfa or rent payers in the Kusba of Hunnumcondah.

	No. of Houses.	*Rent paid.*
Kullals, toddy drawers, - -	33	Rs. 900
Bukhalls, shopkeepers, - -	33	„ 250
Sonar, goldsmiths, - - -	8	„ 65
Butchers, - - - - -	1	„ 43
Beef-butchers, - - - -	1	„ 22
Tobacco-sellers, - - - -	4	„ 22
Tailors, - - - - -	6	„ 22
Cotton-cleaners, - - - -	1	„ 3
Dyers, - - - - - -	1	„ 1½
Dhungurs, - - - -		„ 66
Dhobees, - - - - -	9	„ 45½
Confectioners, - - - -	5	„ 34
Potters, - - - - -	8	„ 20
Weavers, - - - - -	8	„ 21
Pawn-seller, - - - - -	1	„ 28
Oil-men, - - - - -	3	„ 35
Saddlers, - - - - -	3	„ 14
Saltpetre manufacturers, - -	2	„ 12

Most castes and trades, even some of the very lowest, have a set of beggars attached to them, who by importunity, flattery, and some

times threats, extort alms and food from its members; they go about showing pictures, toys, &c., beating tomtoms, recounting the deeds of their ancestors to each caste, and by every means administering to that most prevalent of Indian weaknesses—vanity. They are to be found at births and marriages; Coolies, Dhers, and Choomars have respectively their *mungneewallahs*, as they are called. Yet some of these clients are of use or comfort to their patrons—thus the Correwars, *mungneewallahs* of the Dhungurs, assist them in looking after their flocks and make cumlies, and the Byudlewars are priests of the Dhers.

There are besides the usual number of religious mendicants who beg indiscriminately from all castes; strange to say there are few or no gossaeens, possibly the country is too poor for them. A few of them, it is true, came up to Warungul on a treasure hunt some years ago, and it is said found wealth, which may be doubted; they sought for it in the old temples, and did not hesitate to pull up the floors in their search. There are some Byraghees who are held in a certain degree of repute for piety and asceticism; they are often to be found in the false caves of the granite rock.

Slaves.—The slavery existing in India, it is well known, is a different thing from the slavery of North America or Brazil, not that the slaves are less bondsmen in the one country than in the other, but the treatment is widely dissimilar. The African is worked like a beast of burthen, the Indian is cared for as a valuable servant. Slaves are employed in various ways, they cultivate the ground, act as a kind of body guard to the wealthier zemindars and are then called *khitmutgars;* they are even made havildars of villages, and are allowed to possess property. Slaves are commonly purchased during famine times when all castes and classes, save Brahmins, are compelled, for the very existence of themselves and their offspring, to resort to this mode of relief; they are never resold, not even when their masters have, through misfortune, been reduced in circumstances. On which occasions their services are lent to the wealthy who feed and clothe them, but offer no other remuneration to their owner; male slaves are allowed to contract marriages, but the females are not permitted to do so. At the Dussera clothing is dealt out to them, the women get a saree and a chowlee, and the men an *angreka*, *dotie*, *doputta*, and a *pugree*, and on occasions of marriages they may get a dress more. The

caste of slaves is unaffected by their condition, save in the case of their being sold to Mahometans, when they become of that faith. The price varies much, a rupee or two in seasons of extreme scarcity is sometimes all that is given, but in time of plenty their price rises, for then the market is but scantily supplied.

They are generally treated with kindness, the female slaves address their mistresses as *umma*, and they are themselves called ayah. Instances of extreme fidelity on the part of khitmutgars to their master are recorded, but the curse of slavery, all mitigated though it be, clings to the institution. Slaves of zemindars who are the class usually possessing them, are often spies and informers, the objects of terror to the ryot and tradesman, who dread their approach as a pestilence.

The sects of some of the castes has already been noted—besides those already noted, the oilman, weavers, some carpenters and goldsmiths are Lingayets, and the number of this sect may in some degree be estimated by their having a gooroo living near Warungul, who fashions lings from the steatitic granite for the poorer classes, and consecrates for the richer the symbol formed of materials more costly; the ling boxes are made by the goldsmiths. But the religion of the Brahmins, as set forth in the sacred books, deformed though it be by polytheism, does not satisfy that insatiable craving for idol worship which seems so inveterately to exist in the minds of the natives of India. Hunnumaun, it is true, the representative of the good principle, has his honors undivided, but the evil principle, the ever active agent to afflict and torment, is propitiated under numerous forms. Not to mention the terrible incarnations of Devi, there is the feticism of the snake and the Saktis Yellumma, Peddumma, Poshumma, Mysumma, and Sowdalumma.

Yellumma is worshipped by all sects save the Brahmins, the Coomars are her priests; Poshumma is the goddess of the small pox; Mysumma, of tanks, to whom a buffaloe calf is sacrificed; and Sowdalumma is the *Sakti* of the Coorwars, and is represented by a black stone. The Dhungurs have a god of their own, *Molunna*, who is said to be the Kundoba of the Mahrattas. Before him, when the season has been favorable, they are swung with a hook fixed in their backs, at a village called Ainool. They also worship a deity called *Poolraj;* he is not represented by an idol, but an altar of white stones is raised to him, flowers placed on it and pooja per-

formed by his worshippers with their backs turned to the altar. In the houses too of the poorer classes are two lares, *Balumma* and *Danumma.* The first is invoked to protect their children, the second to increase their wealth—images of both their godships may be purchased at any potters for a few pice.

The belief in witchcraft pervades all ranks, and in times of pestilence its professors are oftentimes rudely handled and sometimes put to death. In the hot season of 1845 there was a severe visitation of cholera and five reputed wizards were put to death; at Oorus under the eye of the Peerzada a weaver was hanged, at Purkall a dhobee, and at Cumlapoor a low caste man, a *kullal;* there were two others. They are tried judged and condemned by lynch-law, and though the authorities did not approve of the murders, they did not exert themselves to punish the perpetrators of them.

Food.

The food of the higher classes is not peculiar. The Coonbees and Yelmas who can afford it, eat flesh, and fish is a common article of diet among the lower castes, such as bearers, &c., but a vast proportion of the ryots and low castes rarely taste animal food, and that solely on the occasions of festivals and weddings; ghee with them is a luxury, and curds most desirable food. Bread is made from *jowaree* and latterly from Indian corn which is now coming into use as a bread corn. Rice is occasionally used, and the produce of the millets which are eaten as rice and not made into bread, is mostly consumed in the country. The *jowaree* or Indian corn is bruised, the finer meal is separated from the coarser which is cooked into a kind of pottage called *duleya* and seasoned with tamarind, a very common condiment in Telingana, red pepper and salt. The finer meal is boiled into a kind of gruel called *umbelly*, which is much used in the hot weather when bread is sparingly eaten on account of the thirst it is apt to engender. The cucumbers too are allowed to grow till their seeds ripen, the soft parts are dried and the seeds bruised and made into a kind of chutney, which is eaten with the other part after it has been boiled with some condiment.

The poorer classes are sometimes in great straits for want of food, especially before the *jowaree* has ripened. With the exception of Bunnyahs, the toddy drawers themselves, three castes of Coonbees and some of the Lingayets as the Belgewars, all classes in Telingana drink toddy very frequently to intoxication; nor can this be wonder-

ed at in a country where a man can get drunk for a pice and a half; the women also drink.

Languages.

Of the languages spoken in the Circar the most prevalent is the Teloogoo, but it is said to be a corrupt dialect, not to be compared in purity with the language of the coast. All Putwarrees' and Bunnyahs' accounts are kept in it, and it is the general language of communication. Hindoostani is spoken by the Government employés, by the Yellawars, and often, not always, by the Putwarrees. Persian is used in written communications by the higher functionaries.

Mahratta is spoken by the Mahrattas, and Canarese by the Mudwacherry Brahmins and the Correwars, the clients of the Dhungurs. A very corrupt Tamool is spoken by the Yerkulwars.

Health and Diseases.

The granitic country is salubrious, but the sandstone has a very indifferent reputation. Fevers, spleen, &c. are there very common. The corps and squadron of cavalry stationed in the neighbourhood of Warungul has enjoyed excellent health since being cantoned there. Cholera is said to visit the country epidemically every four or five years. The last time it raged with great severity was in 1845, when it numbered a large proportion of Mahometans among its victims, a fact observed in other and distant parts of the country. A patient attacked with cholera trusts little to the power of remedies, the chastising *Sakti* is sought to be propitiated, and gifts are promised on condition of his being spared. Abstinence is greatly relied on in fevers, frequently no other means are taken to cure it. The Hakeems destroy the effects of many valuable drugs within their reach by subjecting them to the action of heat, fancying that the *caput mortuum* of charcoal that remains after combustion contains all the properties of the remedies they put into the pot.

Education.

In most large villages there is a schoolmaster wholly dependent on fees and gifts, who professes to teach reading, writing, and arithmetic. All castes without distinction are admitted to the school from the Brahmin to the *Zeengar* (saddler). Religion is not inculcated, that task being left to the priests of the different sects. The schoolmaster is usually a Brahmin. He may derive a couple of annas a month from each pupil, with a gift of grain as can be afforded. The pupil is first

taught to write in sand, and then he furnishes himself with a black board and a pencil of steatite. The punishment for the remiss and negligent are flogging and a species of picketting. Their tasks in reading consist of exercises in some parts of the adventures of Rama and Krishna, subjects on which all Hindoos can meet with unanimity, nor are Mahometans so shocked with these legends as to prevent their children from being instructed.

State of litigation and Crime—Police.

The inefficiency and the mal-administration of justice renders it very difficult to estimate precisely the state of litigation and crime. The resort to the Punchayet is the usual mode of terminating disputes of a civil nature, but even this, in itself a very excellent mode of settling disagreements if left to work independently of all influence, is rendered unsatisfactory by the superior authorities often claiming the right to name the *Surpunch.* There is a cazee who has a village in enam near Warungul, but from his ignorance and want of education, being unable to read or write, he is incapable of performing the duties of his office, there has been in consequence a paid functionary appointed; his salary is 70 or 80 rupees.

There are two divisions of police, the village police—who under the name of *muskoree* receive in large villages a rupee a month and some grain; they are offsets from the Dhers, and the government police, who assist in collecting revenue, &c. for which they get three rupees a month. There are a few Arabs in the Circar who receive large pay, varying from rupees 12 to rupees 15 a month.

Streams.

There are no streams of any importance in the Circar. On the north they feed the Godavery or its confluents: on the south the Moosy and Kishna; they are all without names, and, saving the rivulet issuing from the Pakhall tank, are dry nullah beds a few weeks after the rains have subsided. But though of insignificant body, these streams are abundant, and supply the numerous tanks, which are the great and characteristic feature of this portion of Telinganah.

Lakes.

The Pakhall lake has been frequently mentioned—it is sometimes called a Tank, but from examining the bund I conceive that its bed must have contained water previous to the erection of any artificial embankment. There is a myth regarding it—that the hills about it which contain the water were rais-

ed by magic by Brahmin agency to please one of the Warungul kings. There is a *chubootra* about the middle of the bund called the *chubootra* of Sitab-khan, a lieutenant of one of the first of the Golcondah princes who finally expelled the Hindoo dynasty. It is a magnificent sheet of water from thirty to forty miles in circumference. Its shores are well wooded and stored with wild animals—but for six or seven months of the year its neighbourhood is very unhealthy. In its immediate vicinity not much more than fifteen hundred beegahs, owing probably to this circumstance, are under cultivation, but it sends off several streams which are turned to account at a greater distance, and it yields a tributary to the Kishnah river.

Tanks. Besides the Pakhall tank or lake—the most conspicuous sheet of water between the Kishnah and Godavery—there are large tanks at Hunnumcondah, the *kusba* of the Kotacondah, Hussanabad Pergunnah, at Durmasagrum, Nagarum, Woodapilly in the vicinity of Hunnumcondah. At Gunpore, Chelnaee, and Ramapah in the Suntamonium Pergunnah, in the *havalee* at Atmacore, at Yelgoor, in the Pergunnahs Vizianuggur Wordanapet, at Ryapurty, Wordanapet and Mytapilly. There are large tanks also at Purcull, at Poosapilly in the Hussanabad Pergunnah, and at Camlapore a jaghire village. All these tanks, besides many others in the Circar, are furnished with strong bunds of the most solid masonry. The smaller tanks have bunds of earth and stone intermixed, or simply of earth.

The tanks are very old, far beyond the memory of man,—most of them dating from Hindoo times. Some circumstances relating to them have already been mentioned. The embankments are of great strength, and if ordinary care be taken of them are sufficient to contain whatever water may be poured into them—but the Zemindars often allow them to fall into disrepair through short-sighted folly.

There are frequently large natural basins on the summits of the granite rock ; these are seldom turned to account for agricultural purposes, but are regarded as sacred pools to bathe in, by which are cured severe and obstinate diseases.

It was the remark of a great statesman that tanks were the national banks of the Carnatic—and previous to the discovery of America with its maize they were doubtless the great prop of Indian ex-

istence in furnishing rice—a grain wholesome in itself but not to be compared as a food grain with maize or wheat. Tanks therefore, in a certain degree, may be looked on as a great national lottery—for in ordinary seasons, once every three years they are but half filled—and once every twelve years they are completely filled—but being regarded as the great source of revenue, every foot of land which is irrigated by their waters is cultivated, while thousands and thousands of acres of the finest black soil are allowed to remain uncropped by grains far better fitted to support life than rice.

Wells.

There are four kinds of wells—the stone well, the pot well, the basket well, and the mere hole dug in the ground for the purposes of irrigation.

There are but few stone wells now constructed, and those that remain are, in a majority of instances, ruinous or in a state approaching to it.

The pot well, *worrah* by name, is built up with cylinders of pottery, each one of the depth of half a foot, which are sold from eight to twelve annas a piece. These wells may last for thirty years, but much depends on the care that is taken of them, and the goodness of the material with which they are originally constructed. Drinking water is most commonly furnished by these wells. Basket wells are constructed by digging in the bed of a nullah, and placing in the cavity a cylinder of wicker work to prevent the sand from choking the well—they are common in the southern pergunnas.

Wells in the *mohrum* are dug at the following rates—for the first cubic *kola* 6 annas, for the 2d 8 annas, for the 3d 12 annas, for the 4th 1 rupee 4 annas, for the 5th 2 rupees and so on—but water is in many places found at the depth of thirty feet. When granite is to be blasted rupees 4 a square *kola* is charged. The moat consists of an iron *dhole* which may contain four or five pucka maunds of water—but it seldom delivers more than two-thirds of its contents—the iron of the moat costs rupees 7—the leather 8 annas, and the wood work rupees 2½, in all ten rupees—but the Coonbee may have the wood work much cheaper if they supply the material and employ the village carpenter. To work a good moat six bullocks are required,—for the labor is very severe—two men are employed in working it. The assistant is the Choomar, if he can be procured, and a very necessary one he is as the tackle is always needing repairs. The moat may be drawn thrice in a couple of minutes—but this is too much

for an average, as the stoppages and delays in its working are so frequent. For raising water the *garim* and *yatam* are used, and for transferring it from field to field the *goora*.

The Telingana village presents a much more cheerful appearance than the Mahratta *gaoms*. Instead of the dingy wall encompassing the flat roofed houses of mud huts huddled closely together, we have a detached fort, and the cottages white washed and tricked out with red ochre surrounding it or in its vicinity. The condition of the houses and the form of the fort can be much better judged of from the drawings than from any description. There are seldom money payments for hut building, the ryots mutually assisting each other in their construction. The houses are with very few exceptions kutcha throughout the Circar. When money is paid 8 annas is charged for the square *kola*.

The vast proportion of houses are built of mud, and so adherent is it, that bricks are seldom employed for building; inasmuch as what is called a *pucka* house is rarely met with, and where it is generally the property and domicile of the Zemindar of the district, and consists of two stories. In the more wealthy and populous *kusbas* a proportion of the houses are tiled; few are flat roofed, thatched houses predominating greatly. Where the sandstone exists the soil is less adapted to house building, in consequence of which timber, which is plentiful, is preferred for the construction of the better class of habitations, and bamboo for the meaner huts.

With the exception of gardens, which are surrounded with a milk bush hedge *(Euphorbia tirucalli,)* the fields are not enclosed. The rudeness of the agriculture has been already pointed out. The commons are rented by *Dungers** who are ranked among the moturpha.

Towns and Villages.

HAVALEE AND PURKULL PERGUNNAHS.—The most extensive joint pergunnah in the Circar. The villages are chiefly rented by the Surdeshmookh Venkut Nursinha, and his brother Gurmajee, and by the Surdeshpundya Mulleya. The chief towns are Muttawadda, Ramanapett, Girmajeepet, and Hoosumpurty, all open villages. In the pergunnah tables I have affixed an asterisk to the villages which have more than 1000 inhabitants. Purkul, the kusba of the pergunnah of the same name,

* In the village returns they are so ranked.

is a straggling village with a ruined mud *gurree* in its *enceinte*, after the fashion of Telinganah.

Warungul, the ancient capital of Telinganah, situated north latitude 17° 57½′ and east longitude 79° 39½′, possesses an interest separate from its present condition of a ruinous village. With the exception of four gateways, which led to the great temple of Siva, and which still remain in a tolerable state of preservation, there is nothing but ruins to denote its former grandeur. Sculptured as these remains are out of a hard greenstone, admitting of a fine polish, the figures cut in the stone retain their outline unimpaired as if they had just come from the chisel. It is impossible to trace the exact form or dimensions of the original temple, so utter has been the desolation, not from time but the violence of the Mahometan conquerors, who, not content with razing the whole structure to the ground, have carried their work of destruction a step further, by using the beautifully sculptured fragments of cornices and capitals as materials for building the inner stone wall of the fort, which is thus clearly the work of the Musselmen. But the persevering piety of the Hindoos has rescued some relics of their great temple; and one whole pillar, attesting what their temple was, is yet preserved, although not on its original site.

The history of the Andra kings of Telinganah, is about as well known as that of any other Hindoo dynasty previous to the Mahometan invasion; and the inscriptions in an old Teloogoo character found at Warungul have, most of them, been copied and commented on by the learned in Indian antiquities. They chiefly relate to the power, wealth, and extent of dominion of the Andra kings, with the usual bombast and inflation of such productions. Tradition has, as usual, been busy in falsifying what was true, and forging what is impossible. The glories of Pertab Rudrah, the splendour of his temple, the hidden treasures that lie concealed, are, to this day, among the Hindoo population, constant themes of admiration, regret, and curiosity. But in viewing the ruins some consolation may be derived by the Hindoo in seeing the mosque and palace built by the leader of the Musselmen, Shitab-khan, mingling their ruins with those of his own fallen fanes and palaces.

The inner wall of the fort is about three-quarters of a mile in diameter, with bastions, and four gates. Five hundred yards external to it there is a mud wall seventy feet in height, with a

ditch; and external to that another mud wall of the circumference of twenty-four miles. The labor of constructing such enormous mounds, must have been great, and we are justified in believing that the population of the Indian Gibeonites, such as the Woodeawars, must have been greater in those days than it is now. Was the government of the Andra kings a paternal rule like that of the Incas, or was it the unmitigated tyranny of the Pharoahs? The scanty remains of the outcast population, and the huge works tradition assigns to their labor, incline us to the last conjecture.

PERGUNNAH OOPAL—CHENDAGHERRY. These two pergunnahs are usually classed together—in the first there is no considerable village—the most populous not containing more than eight hundred inhabitants. In the second there is but one town that rises above a thousand inhabitants—Wungapilly. In both these pergunnahs money rents are included in the *sevaee jumma;* the grain rents under the head of land revenue.

KOTAGUTTA KATAJPOOR—as the pergunnah is called—Katajpoor being at one time a place of some importance. It is now a wretched village consisting of mud huts thatched. The chief towns are Hutmakore, or Atmacore, the residence of the Surdeshmookh, who has his house there surrounded with a substantial brick wall—Dogundee, and Kalapurthee.

PAUKAL HUSSANABAD, KOTACONDAH HUSSANABAD.—Hussanabad is a pergunnah, the villages of which are scattered over the whole Circar, but chiefly are associated with those of the Kotacondah and Paukál pergunnahs, Hunnumcondah the residence of the Naib Taloogdar, adjoining to which is the British cantonment, is a large village with many tiled houses. It is situated under a black granite hill, and from the remains in its neighbourhood must formerly have been a place of some consequence. These remains consist of an ancient Hindoo fortification, a temple dedicated to Siva and Jain, figures cut out of the granite hill in *alto-relievo.* Its town duties and taxes are shared by six zemindars. The Koorwah talookha is attached to Pakhall, a wild tract inhabited by Koorwars—an indigenous race who speak Teloogoo, but are not Hindoos. The nature of their country may be conceived from a saying of the natives, that a red squirrel can reach Bundrachellum on the Godavery, by leaping from tree to tree. Their villages are the merest hamlets, with a small patch of cultivation adjoining them, having to

till them some Telinghee cultivators from the plains. The Talookha is assessed at Rs. 9,000, but it is with difficulty that a regular payment of that sum is procurable; and, strange to say, it is only in seasons where the monsoon has been scanty that it can be fully realized, or its arrears paid up. This happens from the shrinking of the waters of the Pakhall lake affording the cultivators an opportunity of rearing a coarse description of rice.

Pergunnah Sumthamonyam—Chillavoy. The latter is sometimes dignified with the name of pergunnah. The greater part of this pergunnah is covered with wood, and the villages are the worst conditioned of any in the Circar. Raycondah, the *kusba,* is a wretched place composed of a few huts. At Chelpore the *tusser* insect is bred, but to no great extent: it is the most considerable village in the pergunnah, but its inhabitants do not reach a thousand. Gopal Rao, a Yelmah, is the chief Deshmookh, but his villages are now in *amanee.*

Vyzianuggur and Velpecondah.—This joint pergunnah has few large villages, but it is in good condition. Vyzianuggur is deserted, and nought remains of it save a mosque in ruins. Vurdanapett is a tolerably sized village. Conee Reddy, a Coonbee, is the chief Zemindar; last year he abandoned his district from discontent, leaving the government agent to collect and settle the revenues.

Pergunnah Balicondah.—The hill fort and *kusba* of Balicondah are now deserted, Ingoorthy being now the principal village. The pergunnah is in good order: the principal Zemindar is a Coonbee Deshmookh of the name of Nynwara. He has also had his differences lately with the government.

Yelgore and Gootheputhee pergunnahs.—These two small pergunnahs demand little notice. Yelgore was formerly a place of some consideration as its ruined fort testifies.

Jagheer Villages.

These with the exception of Warungul, already mentioned as belonging to the Havalee pergunnah, and Zufferghur in the Velpecondah pergunnah are chiefly situated in the Kotacondah Hussanabad pergunnah. A good many villages formerly belonging to Jaghiredars are now *khalsah.* Suraj-ool-moolkh, the present minister, holds the greater number in the Kotacondah Hussanabad pergunnah. The Killadars of Warungul and Zufferghur remain unchanged. Zufferghur is a well built fort,

having been erected seventy or eighty years ago, by a very powerful noble Zuffur-ood Dowlah, to overawe the refractory zemindars. It has a stone wall, a ditch, and bastions surmounted by pieces of cannon, some of them of great size. It has a garrison, nominally of three hundred men, but their place is supplied by about fifty ill armed and coarsely dressed *pyaders*.

Population. The population returns, allowing fifty inhabitants for each Corwa village, and an addition of two thousand for the Woodewars, Yerkulwars, &c. give 41 inhabitants to the square mile, a low average which is accounted for by the vast wastes of the Pakhall and Sumthamonyam pergunnahs, which occupy nearly half the area of the Circar. Rejecting the Corwa villages, there are in the Circar 501 inhabited villages, with an average of 257 inhabitants to each village, and 4·71 for each house.

There are 5030 Musselmen in the Circar, giving an average of about four per cent. to the Hindoo population. The cotton cleaners and carpet weavers are Mahometans.

There are no registers kept of births or deaths in this Circar. It is thus impossible to furnish any statistics of the rate of increase of population or of mortality.

I need not here repeat other particulars that may be found in the general summary, which gives, I believe, a true picture of the present condition of the Circar.

It was my intention to have endeavoured to have given a rough estimate of the land presently assessed in beegahs, or acres, using for data the quantity of seed sown, and the amount of money rent collected, but the conflicting statements I received of the proportion of seed required for sowing a given space, and the constantly varying rent according to the quality of the ground, have induced me to abandon the attempt, which I do with little regret, seeing how profitless and without value, in the absence of an accurate revenue survey, any such estimate would be.

The gross revenue may be thus summed up :

	Rs.	A.	P.
Revenue derived from Land, Shop, and House Rent, Kullalee, &c. - - - - - - -	2,70,958	8	2
Sahyer, - - - - - - - -	14,251	0	0
Zemindars, &c. allowances, 15 per cent. deductions from the Government collections, - - - - -	40,643	11	2
Total Rupees..	3,25,853	3	4

A discrepancy will be observed between this statement of the revenue and the one I previously gave in my report of last year; but in calculating them I had only data partly conjectural, and partly what the Circar yielded when under European superintendence, to go on. Two bad years, 1845 and 1846, with a change of Talookdars have contributed to lower the revenue.

Manufactures.

The chief of the manufactures and the only one for which Warungul is famed is that of Persian carpets which are made of all sizes and of worsted cotton, or even of silk.

The weavers are all Mahometans and are congregated principally at Mutwarrah, although there are a few looms within the Warungul fort. The method of weaving these carpets has been often described, and will at once be seen by a reference to the Plate.

The weavers are a set of drunken, turbulent, ignorant Mussulmauns, possessing no capital, but dissipating in excess the little money they may procure on accomplishing a piece of work. Carpets, chiefly of a small size about two yards long and a little more than a yard in breadth, are made for the Hyderabad market—money being advanced to the weavers by the dealers there. A worsted carpet of this size and shape costs at Warungul from rupees $2\frac{1}{4}$ to rupees $2\frac{1}{2}$. A cotton carpet is twice the expense of a worsted. A silk one is very highly priced—a common trick among the weavers is to substitute *sunn* for worsted.

There is a coarse cotton cloth manufactured, called *cadee*, in pieces of nine and twelve yards in length and a yard in breadth, of the price of two or three annas a yard, according to its texture, also cotton *sarees* of the length of ten yards, and a yard and a half in width from 2 to 3 rupees. When colored they are valued at rupees 4 and rupees 5, according to the color with which they are dyed—the madder and *cherwil* being deemed the fastest and most expensive dyes. When the border is ornamented with embroidery, or woven with silk, the piece is seven rupees. Silk cloth, of the width of the curtailed guz, is manufactured and sold for 12 annas a yard, but the quality is very inferior. It is dyed red with lac, green with indigo and turmeric, or yellow with turmeric alone. The *tusser* cloth manufactured is one half the value of the silk. *Chowlees*, (women's breast cloths) are manufactured but not in sufficient

quantity to supply the district, as they are imported. Cotton *pagrees* dyed with *koosum*, indigo, or the bark of the mango tree, which communicates to the cloth a dingy yellow, are made and sold for 2 and 2¼ rupees, and are 15 yards in length. An undyed cotton *pagree* of the same size may be had for 1 to 1½ rupee. *Dhotees* too are manufactured for 2 to 2½ Rs., and chintz *rosaees* for 2 Rs. *Sarees* for young females are stamped and sold for 12 annas. *Tutputtee* of different qualities and strength, from 12 to 6 annas per piece of seven yards, is likewise manufactured, and from it, when old and unserviceable, a coarse paper is made. A bounty on the preparation of which is granted, by the manufacturer being ranked among the Khooshbash.

The other manufactures in the Circar are *tusser* cloths at Hoosainpurty—and Chilpore silks at Mutwarrah. Cotton cloths of all descriptions at Mutwarrah, Hunnumconda, Girmajeepet, Chintaguttoo, Goodoor, Ramnahpett, Siampett, and Oopul. At Umballa cotton *shutrungees* are manufactured and also at Mutwarrah—from 10 to 12 annas is paid. With the exception of the Warungul carpets almost all these manufactures are exclusively for home consumption—and this very fact will explain how they are mostly of an inferior description. The *tusser* cloth—although the cocoons are the produce of the same insect as those of Bengal—bears no comparison in fineness or durability with the *tusser* cloth manufactured there. The silks are dearer, and the cottons of the same price as those produced nearer Hyderabad.

There is no large village, and but few middle sized throughout the Circar, that has not some looms for the manufacture of the coarser cloths.

Particulars of the expenses of a piece of *cadee* (coarse cloth) 18 cubits long and 2 cubits in width—sale price from 14 annas to 1 rupee 2 annas.

	Rs.	A.	P.
90 pice weight of cotton (2¼ lb.) - - - -	0	0	10½
Cleaning the cotton (Sathab's wages,) - -	0	0	1
Spinning the thread, - - - - - -	0	0	7½
Weavers' wages, - - - - - -	0	2	4
	0	3	11½

Of such cloth the weaver can manage to weave five cubits a day, so that his wages are a little more than seven pice a day.

A small quantity of saltpetre is made at Hunnumcondah and the gunpowder required by the government is made by the saltpetre manufacturers, the charcoal and sulphur being supplied to them.

Indigo of a very coarse description is manufactured at Hunnumconda—a specimen forwarded to Calcutta some years ago was pronounced by competent authority to be very inferior. Buchanan's account of the manufacture in Mysore tallies with that of the process here—except that the leaves of the *Barleria prionitis*, and the *Wrightia antidysenterica* are occasionally added to those of the *Indigofera cœrulia*. The manufacturers are Derzees and other low castes. Sesamum and other oils are expressed by the Tillees—but castor oil is obtained by pounding the seeds and boiling. A coarse kind of wrapping paper is prepared at Mutwarrah, and coarse soap and leather for home use are manufactured. There are a few calico printers at Mutwarrah, who print *sarees* and handkerchiefs—their dyes are confined to the dingy red of the Indian madder—and the black of the myrobalan; green and black bangles are also made in the Vizianuggur pergunna.

The dyes chiefly used in dyeing *tusser* and cotton are *chervil* and *cherrongee* roots of the *Oldenlandia umbellata* and the *Morinda tinctoria* ground. The dyeing is a very tedious process, occupying from 40 to 50 days—the result is a durable though a dingy red. —but the *chervil* gives a brighter colour than the *cherrongee*. In dyeing linseed oil is commonly employed, but the oil from the seeds of the cucumber is preferred.

Iron is manufactured from the oxydulous iron ore already spoken of; the process is the same as that which obtains in other parts of India and has been often described. It is made at Koomarapilly, Erapilly, and Mulkanoor where the ore is found, and in other parts of the Circar at some distance from the iron mine. Two pieces of iron are prepared by each furnace every twenty-four hours of one and a half maunds each, from ten maunds of the ore. A rupee is charged by the miner for five kundies of the ore.

The privilege of mining being purchased at rupees 12 a year to Government, and rupees 4 to the Zemindar.

Bell metal is cast into vessels at Mutwarah for home use.

In my next report I shall mention any circumstances that appear to me worthy of noting respecting this branch of the subject, but it must be confessed that it is an uninviting one. The manufacturers

of India are doomed, and in a short period of time we may see Manchester *sarees* as we now see British long cloth in every bazar. The imports and exports are given in the Appendix. Transit and communication are kept up chiefly by bullocks and carts—the first estimated to carry a pullah—the second from two and a half to three pullahs. The Circar having no running streams there is little interruption to communication throughout the year. There is not a made road or a bridge throughout the Circar.

There is no regular post. The government despatches are forwarded by peons every third or fourth day. There is a singular want of choultries in the Circar, and the only place of resort approaching to an inn is the shop of the *kullal,* who distributes highly spiced food to Mahometans and the low castes who can afford it. In expresses the usual method of employing the village *dher* is had recourse to.

Taxation.

The mode of assessment in this part of the Hyderabad territory consists in the government letting to the principal zemindars a certain number of villages for a limited period, to be renewed if the parties perform their contract satisfactorily, which is termed the *surbastu cowle*, or tenure. The sum to be paid annually is fixed without any reference to favorable or unfavorable seasons; remission of revenue under native government not being practised.

In case of the Zemindar failing in his contract the villages become amanee, and the Putwarees settle direct with the talookdar or his assistants.

It is understood that the Government officers on all occasions mediate between the Zemindar and ryot, protecting the latter from extortion and oppression, and seeing that the former meets with his dues.

The vices of this system are less inherent in its nature than in its general working. A good talookdar who faithfully performs his duty, and sees justice executed between the farmers-general and his tenants, may make his districts flourishing, and render the people prosperous and happy; but under a needy, indolent, and unprincipled talookdar, the defects of the system stand glaringly out; nor is it necessary to show how his wilful negligence and remissness press more heavily on the helpless ryot, than on the more powerful and wealthy Zemindar, who has always means at hand to coerce and silence the cultivators, and not unfrequently the power and disposi-

tion to set the Government authority at defiance. Under such circumstances the sole mode of redress left to the ryot, is to abandon his village and leave his fields unreaped, a proceeding by which he punishes nearly as much as he avenges himself, and which he will not have recourse to, save under grievous oppression and exaction.

When the Zemindar deems himself aggrieved, he either quits his district, and leaves the Government to settle with the Putwarees, who are usually in his interest, and whose study it is to perplex the talookdars with forged documents, or false returns, or he takes to his *gurrees*, and openly resists; but at other times when he sees that he cannot help himself, he makes a virtue of necessity; quietly suffers his villages to become "*amanee*," till his debts and arrears are paid off; subsisting in the mean time on the allowances to which his hereditary office of Deshmook or Deshpundya entitles him.

The Putwarees are the real heads of the villages, even when the Patells exist, they are set aside by the Zemindar, and receive their allowance rather as a matter of favor than right. The revenue is classed under the heads of 1st, land; 2d, *moturpha*, shop, and house tax; 3d, *kullalee*, spirit, and toddy; and 4th, *sevaee* or *sevoy*. This last tax in its original signification should yield a very small sum, being made up of petty village taxes, fines, &c. Yet in some pergunnahs it is found to yield as much as the land tax! This arises from all lands let for a money rent being included in the *sevoy jumma;* it is difficult to account for the origin of this perversion. Where there is much dry grain cultivation the *sevoy* thus predominates.

An assessment called the *koolkamil* exists—but no one can tell any thing approaching to truth respecting its date, its author, or how it was drawn up. Regarding the two first there is in fact no account whatever, and as to the third some say the whole circar was surveyed and assessed by the beegah—others that a rough estimate was taken of the surface—and the whole rock, jungle and cultivated land assessed at a low and equal rate.

It is in all probability a rack rent drawn up by some of the first Mahometan ministers—to please his fancy or that of his prince,—and it is doubtful if ever it was put in practice—at all events it is quite inapplicable now. The collection of the moturfa or house and shop tax is mixed up with the land revenue—but there is a separate establishment for the land customs and transit duties under the Sahyer naib.

The officers employed in the collection are, a Circar naib under the Talookdar Sumboo Persaud, who has under him eight inferior naibs—who, assisted by a peshcar, superintend the collection of one or two pergunnahs each, and render their reports and collections to the Circar naib who resides at Hunnumcondah.

The grain rents are stored in granaries in the forts of villages, and sales are effected according to circumstances to Bunnyas of the country or to the same class, residents of Hyderabad, or agents sent from thence. The exchange on Hyderabad is usually one per cent. against the Circar, although the halee sicca be more valuable than any of the rupees current there. The sowcars giving as a reason that they have the expense of transporting the halee sicca rupee to Hyderabad, which is very seldom the case. The hoondees are commonly at nine days' sight.

The present minister proposes giving the Talookdars or Zillahdars a fixed salary, but the practice that has hitherto prevailed throughout the Nizam's country has been to give an allowance of two annas on the rupee to the Talookdar on whatever collections he may make, but from this sum he is expected to support the whole of the civil expenses including peons. The inferior officers employed in the collection are sheristadars, usually Brahmins, who are accountants and attached to the lesser naibs—and havildars who collect the revenue of one or more villages. The salary of the Circar naib is rupees 200 a month—of the deputy naib rupees 40 to rupees 50. Of the peshcar rupees 20 to rupees 25—and of the havildars and sheristadars rupees 10 to rupees 12.

There is also a head peshcar or surduftur with a salary of rupees 60 per month, and a sursheristadar with rupees 60 who receives his accounts from the lesser sheristadar as the surduftur, who resides at Hunnumcondah attached to the Circar naib, receives the accounts from the inferior peshcars.

The havildars are paid in the amanee villages—that is the villages under the immediate superintendence of Government by the talookdar—but in villages where there is a middle man they often receive the share of the extinct Patell whose place they occupy. The sheristadar is paid by a small contribution from each village.

The Circar naib is a Mussulman, the deputy naibs Mussulmen and Hindoos, mostly all the other inferior functionaries engaged in collecting the revenue are Hindoos. Such are the officers and the mode of collection of the revenue. A vamping up of the old Hindoo

system,—the functions of the Talookdar, naib, deputy naib and havildar being those formerly exercised by the Surdeshmookh, Deshmookh, and Patell. The surduftur, peshcar, &c. answering to the Surdeshpundya and Deshpundya—yet in name and in possession of certain rights the old Hindoo officers remain. The whole is a ruin with the parts standing ill-patched—having for a parallel what we see in the desolate city of Warungul—gates that give entrance to no temple, and pillars that support no roof, meet representatives of Hindoo Zemindars who exist for self aggrandizement alone—while the mosque formed from the desecrated and ruined temple, with here and there a pillar of a different stone and of far inferior execution to what it is designed to imitate—and Hindoo shrines built up hastily and without taste or order, are no unfit emblems of the modern functionaries as they now exist.

The land customs and transit duties are under the *sahyer naib* who receives 40 rupees a month, with inferior collectors at each *masool* chokee.

Chokees.

The number of these in the Circar is no less than forty-four, and the sum carried to government on account of land and transit duties only rupees 14,251. The accounts of the sahyer are very complicated—and it is with some difficulty that they have been reduced to the form in the Appendix. A revision of the land and transit duties is now in progress and some of them have been abolished or modified. Nothing can be more vexatious than the manner in which they have been exacted.

For the carriage of salt to Hyderabad certain parties receive permits at different rates. Some of the more deserving and respectable, if such terms be applicable, of the brinjaries are permitted to pass their goods at a more favorable rate than others, on condition that they take certain roads to avoid collision with others of a different caste, for bloody quarrels have often been the result of such meetings.

Fairs.

There are no fairs of any great importance in the Circar, but still considerable gatherings, when the season has been favorable, take place.

1st. Ainool, in the Vizianuggur pergunna, where the Dhungeers swing with a hook fixed in their backs before their god Molenna—the Kundooba of the Mahrattas—and for the privilege of torturing themselves they pay a fine to government according to their means.

This fair lasts five or six days and is held in January. Cloths, cocoanuts, sugar, metals, silk and *tusser* are brought to this fair.

2nd. At Chelwaee. There is a fair in the cold season where there is a famous *sakti* of the Coorwars.

Sowdalumma. This fair is chiefly for jungle produce. There is a black stone to which the richer votaries of the goddess tie a young bull which becomes the property of the Zemindar.

At Ramapatalao. There is a fair for jungle produce in the beginning of the hot weather at Catacondah for cloths, &c. about Christmas; and at Chundragiri in the hot season, which being a holy place no *kullals* nor butchers are permitted to attend. There is also a fair for tusser cloths, &c. at Yerraguttoo near Hoosainpurty at the Hooley; and at Meereecondah in the hot weather a fair for cloths, groceries and drugs.

At Molunna's fair in good years so much as rupees 500 are raised from the rents of booths and from the Dhungeers, three-fourths of which goes to government, and one-fourth to the zemindar. At Meereecondah the small sum raised is equally divided between the Zemindar and village officers.

At the other fairs 2 pice a shop is levied for the zemindar. One for the Putwarree, one for the havildar, *dorwa*, or patell. The *Yellwar* gets a *dhumree* on each shop and the other village officers small presents.

In my report I have omitted to state that a tappal and banghy dak from Nakricul to the cantonment of Warungul has been established since March last.

Annexed are drawings* of arms and musical instruments. A specimen of native drawing and painting, the figure of the Dhungeers' god Molunna, accompanies the report.

History.

In the possession of the family of the Surdeshpundyas there is a chronicle of the kings of Warungul. Like all such Indian histories it bears the stamp of being a compilation from popular traditions at a period not very remote. The miracles it gravely records, the length of reigns assigned to each king, deprive it of every claim to being esteemed authentic history, but as a specimen of brahmin pretence and brahmin lying, minister-

* The drawings here referred to, as well as at pages 223, 224 and 270 have not yet been received, but we hope to present them to our readers in a future number, as soon as the promised copies arrive.—Eds.

ing to the childish vanity of the Hindoo, it is perfect in its way; yet some threads of truth may run through the web of misrepresentation, such as Kundhur, a fortress twenty miles south of the Godaveri not far from Nandair, being the first seat of the monarchy; Hunnumcondah where there are remains of extensive fortifications, being the capital before Warungul. For this reason a brief account of the history will be given, illustrating too as it does what monstrous deviations from all truth are eagerly seized on by the Indian mind.

The rajahs of Warungul drew their origin from Narrain himself and counted Brahma and a host of *rishees* as their ancestors. It appears that one of these heaven-descended mortals came—from whence or for what reason the chronicle is silent—to the Deccan, and settled at Dhurmapoor a village on the south bank of the Godaveri: that he subdued many rajahs, took four hundred and sixty fortresses, and built the town of Nandair, on the Godaveri. By constant fasting and sacrifices he gained so much heavenly wisdom, that he was deemed a meet companion of the gods, and admitted into their abode; such was his courage that while in the celestial company he stood undaunted before the awful form of Nursing Deo. This so pleased his protecting divinity that she conferred on him a sword, a shield, and a pair of slippers, all of miraculous power, especially the last, for no sooner had he placed his feet in them, than he was whirled through the air, and straightway rested in his own capital of Nandair. Armed with his god-given weapons he waged a successful war against the rajah of Chola, whose daughter he married; and on threatening the king of Ceylon with invasion was only diverted from his purpose by submission and promise of tribute. Fortunate in all his wars he wearied of the world, and for a life of contemplation resigned his sceptre to his son. This son cursed by a wild beast while out hunting, went mad, but being cured by a *gooroo* he had a son born to him. Meanwhile his sister also had a son, and between the two children the *gooroo* divided the kingdom. Then came famine, pestilence, and civil wars, and the next rajah we find reigning at Khandhar where he waxed great and wealthy, but his munificence was equal to his riches, for on the Brahmins he conferred many thousand villages, and dying he left his throne to his son who rivalled his father in generosity but not in fortune; for waging war with the king of Kuttack who was envious of his prosperity, and coveted the possession of his flocks and herds, he lost his life in battle, and his capital of Khandhar was plundered and destroyed. His wife who was pregnant fled to Hunnum-

condah, whither she was followed by her enemy, but the rajah there took pity on her, and by a stratagem rescued her from the wrath and vengeance of the rajah of Kuttack. The son was born in due course, and grew up a fine manly boy, forward in his learning, for every day he repaired to be instructed at the temple of Pudmatchee amah Devikee, protectress of his fathers. One day he forgot to bring home his writing board and book; ashamed of his negligence and anxious to retrieve it he got up in the middle of the night, and proceeded to the temple. At that dread hour the *devi* and her train were preparing for their horrible revels, but the boy shrunk not from the sight of terror, but boldly demanded his board and book from the goddess, who to try his courage had possessed herself of them; nay, he even endeavoured to snatch them from her grasp, whereat the divinity felt pleased and asked the boy what was the wish of his heart, and he at once replied, "the rajah of Kuttack slew my father and I wish to be revenged on him," on which the *devi* changed his book into a sword, and his board into a shield, and giving them to the boy told him he would be the father of a race of kings, who would reign for a thousand years. When he grew up he placed himself on the throne of his ancestors in Hunnumcondah, and began to reign in Shalivahan, 236; but he rested not till he raised a large force, with which he went up against the rajah of Kuttack whom he slew. But placing the rajah's son on the throne of Kuttack he received three crores of pagodas of tribute from him, and returned in triumph to Hunnumcondah. In all his enterprises of war and peace, fortune attended him; his liberality to brahmins was unbounded, and after a reign of one hundred and sixty years, he left his throne to his son, and went to gather lilies with the deities who pluck these flowers in the *pudmagoondum.* His name was Madawaramah; his son Pudma sain rajah was successful in war with the rajah of Kuttack. His only trouble arose from his want of offspring, but by assiduously sacrificing to the protecting deity of his house, and the constant offering of pumpkins, he had a son born to him. He died in 474 Shalivahan.

Devenamaraj, his son reigned till - -	557	Shalivahan.
Wermamaraj, - - - - -	633	,,
Goondamaraj, - - - - - -	705	,,
Gerkodeveraj, - - - - -	784	,,
Bowanyuakamul, - - - - -	874	,,
Taoteenamah, - - - - -	948	,,

All these rajahs were mighty men of war, fighting and conquering the rajahs of Kuttack, Guzerat, and Maharashtra, and generally returning with three crores of pagodas to their capital Hunnumcondah.

The next rajah bore the name of Poolraj, he was left a minor by his father. The rajah of Kuttack took advantage of this and besieged Hunnumcondah, which for twelve years successfully resisted his attacks; in the end the siege was raised by Poolraj invading Kuttack with the usual success of his race. Poolraj was a prince of great piety, continually building or repairing temples, kissing the feet of *monees* and feeding brahmins ; no wonder that such piety should be rewarded by a signal discovery. As some carts were bringing in grain to Hunnumcondah one of them without any apparent cause got upset. As it was at night the cartman did not think of raising it till day had dawned, but lay down and slept; in the morning when they were about to proceed to their task, they saw that the iron rings of the cart wheels had become gold. On this they flew to Hunnumcondah, and told the rajah the news, who with his wise men repaired to the spot where the cart had upset, and on beholding the gold were struck with wonder and joy. So they took counsel together and dug on the place, where the miracle was done, and in digging they came upon Mahdeo Persabede Shembolingum which in splendour rivalled the purest gold, and the rajah wished to transport the precious gift of the gods to Hunnumcondah, but the sacred stone refused to stir, whereat the king was cast down,- and sought more counsel, calling *monees* from afar to give him advice, and the holy men performed poojah to the ling and counselled the king to leave the stone where he had found it and then to build a city. So these *monees* founded a city which they called Akshsalinuggur, two coss south of Hunnumcondah in Shal. 909, and a road was constructed between the city and the town, and shrines were raised to Mahdeo, to Verabuddroo, to Vishnu and the Saktis, but Mahdeo's shrines in number outstripped them all. As for the expenses of the temples they had only to place a piece of iron beside the lingum when straightway it became the purest gold. Now the king had a son born to him, and on the day of his birth he was told that he would fall by his hand, but instead of destroying the infant as he was advised, the king had him left in the temple of the lingum during the night, whereon the morrow the *Poojarrees* found him, who informed the king, by whom they were advised to cherish the infant that heaven had sent

them, and the son grew up strong and active, and the king made him a havildar and gave him command of the guard stationed to protect the temple. One night the rajah repaired to the temple to perform his devotions and coming in unattended, and as it were by stealth, was mortally wounded by his son, who took him for a thief, but before he died he recounted the story of his son's birth and pointed out that in falling by his hand, he had but fulfilled his destiny, and he recommended to the chiefs his son, who unwittingly had stabbed him, to be his successor. Poolraj was slain in Shal. 1020, after a reign of 72 years. In expiation for his crime of parricide, which weighed heavily on his mind, Roodrah-devi-ky made many pilgrimages, weighed himself eight times against gold which he conferred on the brahmins, and built temples without number; but in the midst of these pious acts he was called away to combat the rajah of Kuttack, whom he conquered. He reigned 68 years, died in Shal. 1088. His son Gunnaputty rajah succeeded, he waged war against the rajah of Deoger, with little success at first, but eventually he was victorious, and compelled the rajah to pay tribute and confer on him the hand of his daughter. He warred as usual with most of his neighbours and with the wonted success of his ancestors, but the great affliction of his house clung to him, the want of offspring, yet by incessant poojahs he so propitiated the deities that a daughter was vouchsafed to him. He died after constructing a hundred villages, which were all called Gunnahpoor, and many tanks, in Shal. 1149. His widow, during the minority of her daughter, administered the affairs of state. She completed the stone wall of Warungul, begun by her husband, and surrounded the city with an outer wall of mud called Boomi Cottah, and an inner wall Pedda Cottah, which remain until this day. This princess rendered herself conspicuous by planting trees, conferring gifts to brahmins, and in sacrificing to Pudma Devi; for her piety she was rewarded by success over all her enemies, foreign and domestic, and her fortune and happiness were crowned by her daughter giving birth to a son, and her people all called her mother; and in commemoration of her exploits she erected eight pillars in different parts of her kingdom to show that none was so great or powerful as she.

On the birth of her grandson she placed the infant on the throne, and called on all classes of her subjects to salute him as their king, and the hearts of all were rejoiced, and every temple and house were painted and the streets cleared of all filth and encumbrance, to tes-

tify their joy, and a cradle was made for the child, of pure gold, richly ornamented with precious stones. She died in Shal. 1187, after a reign of 38 years.

She was succeeded by her grandson Pertab Rudra, the Arthur of Warungul, to whose glory and exploits, albeit he succumbed to the Mussulman power at last, the people still refer with pride. The Mussulmans certainly were foiled in their first attempt to possess themselves of the capital, and hence the admiration that still clings to his name. As to his exploits they are even more extravagant than those of his ancestors. He is said to have had a mercantile navy, which is probable enough, as the people of Telinganah were certainly at one time a maritime nation. His fall, which they cannot conceal, is attributed to treachery and destiny: a sirdar of Warungul, Boochoo Reddy, proved traitor and offered, for eighteen lacs of rupees, to betray his sovereign into the hands of the Mahomedan chief Pooloo-khan; yet before his treachery was consummated, the poojarrees came to the king to complain that the lingum had become powerless to convert the iron placed near it into gold, and the king rising in affright and tribulation went to pay his devotion to the lingum from whence he repaired to the shrine of Pudma Devi, and placed the sword and shield, she had given to his ancestor a thousand years before, at her feet; but in the midst of his devotions the goddess swallowed the sword, and the shield springing up clung fast to her chest. When his ministers and sirdars heard this they all agreed that Pudma Devi had abandoned him, and that he had only to trust to the god of battles. He went out and fought against Pooloo and Shitab Khan who, by the aid of the traitor Boochoo Reddy, defeated the king and made him prisoner, and sent him to Delhi. Thus far, saving the miracles, there may be truth, although defeat often happens without treachery.

But the finale of this veracious history is quite consistent with its tenor throughout. Pertub Rudra was received with great respect by the sovereign of Delhi, who was not a little surprised at discovering three eyes in the forehead of the captive sovereign; on seeing which his regard for him was much enhanced, so he asked pardon of him, and desired to call him brother, entreating him at the same time to return to Warungul and resume his sceptre; but Pertab Rudra declined doing so, being wearied of the toils of government, and requested permission to return to Benares, which the

emperor assented to with reluctance. He gave his daughter in marriage to the king of Beejanuggur, divided his treasure among his faithful sirdars, to all of whom he gave portions of his country, and to his brother he left the throne of Warungul. When he had done this, he clothed himself in his best apparel, and along with his wife proceeded into the midst of the stream of the holy Ganges and his soul was carried up to heaven in a chariot, to the wonder and joy of all his subjects in Shalivan 1263.

Assessment of the Circar of Warungul, according to the Koolkamil, and the land revenue and rents that it now yields.

	No. of Villages.	Assessment according to the Koolkamil.			Revenue now realised.		
		Rups.	A.	P.	Rups.	A.	P.
Pergunna Havalee Chinthalputty.							
Talook Moocherla, - - - - -	14	11,575	13	0			
Do. Naggawarrum, - - -	7	6,156	12	0			
Do. Muttawarrah, - - - -	16	15,355	5	9			
Do. Rungsoypett, - - -	13½	10,877	6	0			
Do. Gheescondah, - - - -	20	15,029	0	0			
Do. Chellapurthee, - - -	6	2,659	0	0			
Total..	76½	61,653	4	9	51,001	0	0
Pergunna Oopul, - - - - - -	30	46,702	5	3	26,001	0	0
Pergunna Chendergherrie, - -	21	23,929	9	9	17,901	0	0
Pergunna Sumthamunnium.							
Talook Raycondah, - - - - -	10	11,625	5	6			
Do. Kodavutty Vuncha, - -	4	2,206	6	0			
Do. Deshpundya, - - - -	4	3,265	15	6			
Do. Venkuttapoorum, - - -	11	8,976	2	6			
Do. Yerecherla, - - - -	7	7,597	4	6			
Do. Wodthala, - - - - -	14	16,821	6	9			
Other Taxes, - - - - - -	0	1,789	5	0			
Total..	50	54,281	12	9	22,501	0	0
Pergunna Hussanabad.							
Talook Unnunth Sagram, - - -	18	20,816	2	9			
Do. Dhurma Sagram, - - -	11	20,618	15	9			
Do. Deshpundya, - - - -	20	24,660	15	1			
Do. Deshpundya, - - - - -	4	1,591	7	0			
Do. Mathanapett, - - -	22	34,715	2	6			
Do. Summuth Reddial, - - ..	16	25,251	9	6	23,001	0	0
Kusba Hunnumcondah, - - -	1	1,881	4	0	7,192	0	0
Total..	92	1,29,535	8	7	26,001	0	0

	No. of Villages.	Assessment according to the Koolkamil.			Revenue now realised.		
		Rups.	A.	P.	Rups.	A.	P.
Pergunna Kothaguttoo, - - -	19	21,644	0	0	13,001	0	0
Pergunna Kuttachpoorum, - -	14	13,699	14	0			
Pergunna Purkhul, - - - -	14	24,680	4	0	12,587	0	0
Pergunna Vizianagram.							
Talook Khypurthee, - - - -	44	64,540	15	3			
Do. Verdanahpett, - . - - -	41	58,816	15	9			
Total..	85	1,23,357	15	0	51,502	0	0
Pergunna Bolleecondah, - - -	20	25,624	13	0			
Talook Nagawarrum, - - - -	15	14,833	6	6			
Total..	35	40,458	3	6	17,001	0	0
Pergunna Paukal.							
Talook Chellavoy, - - - - -	15	9,245	8	0	5,001	0	0
Do. Koorvah, - - - - - -	23	10,668	11	6	3,501	0	0
Do. Paukal, - - - - -	28	53,293	0	9			
Total..	66	73,207	4	3	8,856	0	0
Pergunna Hippagoodum, - - -	17	19,053	1	6	8,251	0	0
Pergunna Yellgoor, - - - - -	9	14,489	3	6	2,251	0	0
Pergunna Goteepurthee, - - -	11	7,507	8	0	2,701	0	0
Total Rupees..		6,55,187	14	4	2,98,250	0	0
Jagheers, - - - - - - - - -		1,11,193	4	6	70,000	0	0
Sahyer Revenue, - - - - - -					14,251	0	0
Grand Total Rs...		7,66,381	2	10	3,82,501	0	0

Estimate of the Expenses of a Cultivator, in Clothes, Furniture and Ornaments.

	RS.	A.	P.
Two sarees a year for his wife, which he gets for - - -	2	8	0
When he gives the cotton-thread to the weaver 4 chowlees,	0	8	0
Clothing for three children, - - - - - - -	3	0	0
Clothing for himself,			
Dhotee, - - - - - - - - -	1	0	0
Doputta, - - - - - - - - -	1	0	0
Roomal, - - - - - - - - -	0	8	0
Cummul, - - - - - - - - -	0	8	0
Angreka, - - - - - - - - -	0	4	0
Rupees..	9	4	0

a year for clothes if the material be furnished to the weaver.

Utensils.

Tallu—the women's dish of bell-metal, - - - -	4	0	0
The man's dish of brass, - - - - - - -	1	4	0
Children's dish, - - - - - - - -	1	0	0
Three lotas holding respectively a half seer, a seer, and two seers, - - - - - - - - - -	3	8	0
A tinned tupella for sour food, - - - - -	1	0	0
A tray for carrying food, - - - - - - -	3	0	0
Rupees..	13	12	0

Woman's Ornaments.

Marriage ornament for the neck representing the lingpoosta of gold and lac, - - - - - - - -	22	0	0
Another neck ornament, - - - - - - -	11	0	0
Another neck ornament, - - - - - - -	12	0	0
Two ornaments for the hair and ears, - - - - -	15	8	0
A silver bracelet, - - - - - - - -	4	8	0
Rupees..	65	0	5

Dhorwaghiri Sunnud in favor of Mahomed Ryan, and his Father Fakeer Mahomed.

Given in the name of the Surdeshmook and Surdeshpundya in our own talook situated in the havalee Chintapilly Pergunnahs. There is a village called Singavarum which has for a long time been deserted, we therefore appoint you to restore it—fear nothing on any account but place your reliance on us. You are to try to bring in the ryots and make the village flourishing—by repairing tanks, ponds, and wells, and whatever may be the yearly rent of the village you are to make over to the Circar and take a receipt for the same. You must be punctual in paying us our dues, presents to Brahmins, temples, &c. according to custom and to every one in the village his due. You will receive your due as follows: 2½ maunds sowing in the poonass and 1½ maunds sowing of rice in the tabee near the Chintal Charroo—besides 4 pylees in the kundy from the produce of the village, and in cash one anna in the rupee from the rents paid by toddy drawers, Bunnyahs, &c.; also the gift of two beegahs of land fitted for dry crops in the rear of a mosque in a field called Guneshpumpoo for marriage according to the circumstances of the parties, and from every field one bundle of common straw and a coonsoo of unhusked grain, one quarter of a pice for every bullock load of grain passing

through the village. We allow you all this and trust you will keep the village in good order.

Signed by the Putwaree.

Countersigned by two of the family of Surdespundyas and by the Sheristadar. Another copy signed as before and countersigned by the Surdeshmookh.

Enams to Temples about Hunnumcondah and Warungul.

To a temple of Lutchmee, Nursing Swamy—1 seer rice a day—2 pice a day—3 pucka seers oil—rupees $4\frac{1}{2}$ a month, rupees 9 a year to the Brahmins—one rupee at the Ramzan and Buckreed—one when a new naib is appointed, also rupees 3 from the sayher, - -	a month, Rs.	18	8	0
To the Hunnomaun, &c. two beegahs of rice land under the tank of Hunnumcondah, oil rupees 45 a month, rupees 2 Buckreed and Ramzan, and one rupee from a new naib, - - - - - - - -	yearly,	15	2	0
To a temple of Mahdet in the town of Honnumcondah one beegah of land—from the Circar rupees 90 a year, from the local taxes rupees 90 a year, and from the general salt tax rupees 180—rupees 9 for oil, - -	yearly,	369	0	0
To another temple of Madeo outside the town—5 beegahs of ground and for other expenses, - - -	yearly,	68	0	0
To the temple of Pudmachmee Amah $9\frac{3}{4}$ beegahs from the Circar—sayher and village taxes, - -	yearly,	159	8	0
To the temple of Sneerungah Naik Sawmy 4 beegahs of ground—other expenses, - - - -	yearly,	96	0	0
To a temple of Ramah, - - - - - -	,,	153	0	0
To a temple of Nursinga Swamy, - - -	,,	63	0	0
To a temple Seetaram a beegah of ground—other expenses allowed by government, - - - -	yearly,	90	0	0
To another Hunnomaun on the tank bund, - -	,,	228	0	0
To the Mahdeo of Rungumpett 4 beegahs of land—other expenses, - - - - - - - - -	yearly,	123	0	0
To Narsing Swamey, (another,) - - - - -	,,	48	0	0
To a third Hunnomaun, - - - - -	,,	24	0	0
To a Poojawary of Mahdavy, - - - -	,,	48	0	0

Tables of Money Weights and Measures.

4 Cowries	- - - - - - -	1 gundah,
$2\frac{1}{2}$ Gundahs	- - - - - - -	1 tola,
2 Tolahs	- - - - - -	1 dumree,
2 Dumrees	- - - - - - -	1 adhela,

2 Adhelas	- - - - - -	1 pice,
4 Pice	- - - - - -	1 copper gundha,
15 Gundahs	- - - - - -	1 rupee.

The Halee-sicca rupee is current—it has not been assayed, at least it does not appear in the money tables of Prinsep, where are to be found other coins of this name, but not the Halee-sicca of this Circar of Hyderabad. In exchange an anna of batta is demanded on the Bagh-Chulnee with which the Subsidiary force is paid ; no gold coin is in circulation. I made inquiries for old coin but was not able to procure any—with the exception of the cowries and pice and rupees these coins are imaginary. There is a large double pice in circulation.

Gold and Metal Weights.

3 Grains of Wheat	- -	1 Gr. of the Abrus Precatorius,
4 Seeds of the Ab. P.	- -	1 Chinnum,
2 Chinnums	- - -	1 Masha,
12 Mashas	- - - -	1 Tola,
24 Tolas	- - - -	1 Kutcha Seer,
5 Kutcha Seers	- - -	1 Tukree,
8 Tukrees	- - - -	1 Maund,
20 Maunds	- - - -	1 Kundee.

Of the weights brought to me twelve seeds of the Abrus Precatorius weighed thirty-two grains of red wheat, but the white wheat said to be lighter. The Masha, a broken piece of porcelain, weighed fifteen grains, and the quarter tola, a weight of iron, forty-five grains. Silk and tusser cocoons are sold by this weight.

Another weight for Iron, also for Ghee, Tamarinds:

$5\frac{1}{8}$ Halee-Sicca Rupees	- - - -	1 Chuttack,
16 Chuttacks	- - - - - -	1 Seer,
$1\frac{1}{2}$ Pucka Seers	- - - - - -	1 Tukree,
8 Tuckrees	- - - - - -	1 Maund,
20 Maunds	- - - - - -	1 Kundee.

The $\frac{1}{2}$ Chuttack brought to me weighed 7 drachms and five grains—the half tukree 1 lb. 8 oz. and 5 drachms, the tukree 3lbs. and 12 drachms. These weights were all of quartz pebbles. The Halee-Sicca Rupee weighs 173 grains.

Weights for Grain.

82 Halee-Sicca Rupees	- - - -	1 Seer,
40 Seers	- - - - - -	1 Pucka Maund,
3 Pucka Maunds	- - - - -	1 Pullah.

This is the common weight throughout the Pergunnas save in the Havalee where there are 56 seers in the maund.

Grain Measure.

2 Solgas - - - - - - -	1 Towa,
2 Towas - - - - - -	1 Pylee,
2 Pylees - - - - - - -	1 Udha,
2 Udhas - - - - - -	1 Coonsoo,
2 Coonsoos - - - - - -	1 Yeersah,
2 Yeersahs - - - - - -	1 Maund,
20 Maunds - - - - - - -	1 Kundee.

The solga of teak-wood contained exactly thirty-four liquid ounces, and the solga measure of red wheat weighed 1lb. 12 oz. 4 drms.

Another Grain Measure.

3½ Seers - - - - - - -	1 Pylee,
4 Pylees - - - - - -	1 Coonsoo,
4 Coonsoos - - - - - -	1 Maund,
20 Maunds - - - - - -	1 Kundee.

The Pylee and Coonsoo measures are earthen gurrahs, a *soop* is as much as can be carried on a winnowing basket, and passes for a Coonsoo.

The Seer Measure contained exactly one imperial quart.

Long Measure.

4 Tus - - - - - - -	1 Peeree,
3 Peerees - - - - - -	1 Guz or Cubit,
4 Guz - - - - - - -	1 Kola.

The Tus varies sometimes as in the above table, it measures an inch and a half, at others 2¼ inches. The Peeree is the measure of a hand with the thumb extended, this is the cloth measure—but the silk and tusser Guz is reduced to fifteen inches—by this measure too all buildings are estimated. The Telingana Coss is short, about a mile and a half.

Superficial Measure.

16 Guz - - - - - - -	1 Putta,
10 Puttas - - - - - -	1 side of a Beega,

which is thus 6,400 sq. yards—or 1 acre—1 rood—11 poles and 17¼ yards.

Average Price of Articles and Produce sold at Hunnumcondah, &c., for six years.

	F. 1251			1252			1253			1254			1255			1256		
	A. D. 1841			1842			1843			1844			1845			1846		
Gold,............per tolah,	22	4	0	22	8	0	22	12	0	23	0	0	22	12	0	23	0	0
Silver,.......... ,,	1	3	0	1	3	3	1	3	0	1	3	3	1	3	6	1	3	6
Brass,.........per maund,	14	0	0	13	12	0	13	8	0	13	4	0	13	0	0	13	8	0
Copper,........ ,,	16	0	0	16	8	0	17	0	0	17	8	0	16	8	0	16	0	0
Katheel,........ ,,	17	0	0	17	8	0	17	12	0	18	0	0	19	0	0	19	8	0
Pewter,........ ,,	6	0	0	5	12	0	5	12	0	5	4	0	7	0	0	7	8	0
Pinchbeck,..... ,,	12	0	0	12	0	0	12	0	0	12	0	0	12	0	0	12	0	0
Tin,............ ,,	13	0	0	14	8	0	14	0	0	16	0	0	16	0	0	15	0	0
Iron,. .... ,,	1	2	0	1	2	0	1	4	0	1	4	0	1	2	0	1	4	0
Lead,.... ...... ,,	4	4	0	4	8	0	5	0	0	4	4	0	5	0	0	4	8	0
Average rate of Paddy for the year.... } per candy,	18	8	0	19	8	0	19	8	0	23	8	0	32	0	0	26	12	0
Do. of Jowaree, ,,	19	8	0	21	0	0	20	0	0	28	0	0	38	0	0	41	8	0
Do. of Chenna, ,,	36	0	0	40	0	0	53	0	0	35	0	0	53	0	0	60	0	0
Do. of Moong, ,,	31	0	0	30	0	0	30	0	0	0	0	0	29	0	0	48	0	0
Do. of Toor, ,,	20	4	0	19	0	0	18	0	0	20	8	0	26	0	0	38	0	0
Do. of Wheat, ,,	0	0	0	0	0	0	42	0	0	43	12	0	50	8	0	25	0	0
Do. of Oord, ,,	0	0	0	0	0	0	38	0	0	36	0	0	0	0	0	0	0	0
Do. of Samah, ,,	10	0	0	10	0	0	9	0	0	15	0	0	15	0	0	16	0	0
Do. of Ralah, ,,	12	0	0	12	0	0	13	0	0	14	0	0	16	0	0	16	0	0
Do. of Indian Corn ,,	9	0	0	10	0	0	10	0	0	13	0	0	0	0	0	0	0	0
Do. of Castor Oil Seeds,.......... ,,	10	0	0	10	0	0	9	0	0	9	0	0	0	0	0	0	0	0
Do. of Bajree,.... ,,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	0	0
Do. of Goor, per maund,	2	2	0	1	2	0	1	3	0	1	6	0	1	15	0	2	0	0
Do. of Sugarcandy, ,,	0	0	0	0	0	0	0	0	0	6	0	0	5	8	0	0	0	0
Do. of Sugar,...... ,,	0	0	0	0	0	0	0	0	0	3	0	0	28	0	0	0	0	0
Do. of Ghee,...... ,,	3	12	0	3	8	0	3	6	0	3	4	0	5	2	0	4	4	0
Do. of Sweet Oil, .. ,,	3	8	0	4	8	0	3	8	0	3	8	0	4	0	0	4	8	0
Do. of Salt,........ ,,	0	8	6	0	9	0	0	9	0	0	12	0	0	11	0	0	12	0
Do. of Chillies,.... ,,	1	2	0	1	2	0	0	14	0	1	8	0	1	8	0	1	9	0
Do. of Tamarind,.. ,,	1	0	0	1	0	0	0	6	0	0	14	0	0	6	0	0	8	0
Do. of Saffron,.... ,,	1	4	6	0	14	0	1	11	0	1	0	3	1	12	0	1	12	6
Do. of Cocoanut,.. ,,																		
Average rate of Betel-nuts for the year, } ℔ maund.	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	0
Do. of Dried Dates,. ,,	0	0	0	0	0	0	0	0	0	4	0	0	3	14	0	0	0	0
Do. of Cardamom,.. ,,	0	0	0	0	0	0	0	0	0	48	0	0	60	0	0	0	0	0
Do. of Cloves,....... ,,	20	0	0	20	0	0	12	0	0	14	0	0	13	8	0	13	0	0
Do. of Jeerah,....... ,,	5	0	0	4	0	0	5	0	0	5	0	0	4	4	0	5	0	0
Do. of Manty,....... ,,	1	8	0	1	12	0	1	4	0	1	12	0	2	0	0	2	4	0
Do. of Sajeerah,..... ,,	0	0	0	0	0	0	0	0	0	28	0	0	36	0	0	0	0	0
Do. of Almonds,.... ,,	0	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0
Do. of Mace,........ ,,	0	0	0	0	0	0	0	0	0	72	0	0	60	0	0	99	0	0
Do. of Nutmeg,...... ,,	0	0	0	0	0	0	0	0	0	60	0	0	48	0	0	0	0	0
Do. of Pepper,...... ,,	12	0	0	12	8	0	7	0	0	7	0	0	8	0	0	6	0	0
Do. of Alum,........ ,,	3	0	0	2	4	0	2	8	0	3	4	0	3	0	0	2	8	0
Do. of Camphor,.... ,,	96	0	0	96	0	0	120	0	0	138	0	0	108	0	0	108	0	0
Do. of Ginger,....... ,,	3	12	0	3	8	0	4	0	0	3	12	0	4	8	0	5	8	0
Do. of Opium,....per lb.	0	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0
Do. of Incense, (Ood) ,,	0	0	0	0	0	0	0	0	0	18	0	0	21	0	0	0	0	0
Do. of Catechu,...... ,,	0	0	0	0	0	0	0	0	0	9	0	0	10	0	0	0	0	0
Do. of Tobacco, ℔ maund	0	0	0	1	12	0	1	14	0	1	12	0	2	0	0	2	0	0
Do. of Lac,......... ,,	6	6	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Do. of Bees Wax,.. ,,	0	0	0	12	0	0	10	12	0	11	14	0	10	9	0	11	12	0
Do. of Modee,...... ,,	8	8	0	7	0	0	9	0	0	7	0	0	6	4	0	5	8	0
Do. of Honey,...... ,,	4	8	0	5	0	0	5	0	0	5	0	0	5	0	0	5	0	0
Do. of Madder,..... ,,	1	8	0	1	8	0	2	0	0	2	0	0	2	0	0	2	0	0
Do. of Cotton,...... ,,	4	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	8	0
Do. of Silk, Raw, seer 1½	18	0	0	0	0	0	0	0	0	0	0	0	18	0	0	18	0	0
Do. of Tusseer,..... ,,	6	0	0	5	0	0	0	0	0	0	0	0	6	0	0	6	0	0
Do. of Movah, per candy,	8	0	0	10	0	0	12	0	0	15	0	0	8	0	0	8	0	0
Bullock's Hide,.. each....	0	8	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0
Cow's Hide,...... ,, ...	0	8	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0
Buffaloe's Hide,.. ,, ...	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
Sheep Skin...... ,, ...	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0
Cumblies,....... ,, from	0	6	to	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0

Imports into Warungul, with the Taxes levied on each article, from the Accounts of the Sahyer Naik.

Land custom levied on jaggery coming from Masulipatam through the Pergunna of Hussnabad, if brought by the ryots of Hunnumcondah and Muttawarra, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,			
Deetchcontah, - - - - - - - -	0	14	3
Havalee, - - - - - - - -	0	11	0
Elgoor, - - - - - - - -	0	2	6
Hunnumcondah, - - - - - - -	0	3	0
If brought by the ryots of other Pergunnas not belonging to the Circar of Warungul, charge at the rate of three bullock-loads, equal to 24 maunds on a cart,			
Deetchcontah, - - - - - - - -	1	8	0
Havalee, - - - - - - - -	1	11	0
Elgoor, - - - - - - - -	0	3	3
Hunnumcondah, - - - - - - -	0	7	0
From Juggiahpet through Paukhal, Hussnabad, Paukhal Hussnabad, - - - - - - - - -	1	3	9
Havalee, - - - - - - - -	0	11	0
Elgoor, - - - - - - - - -	0	2	9
Hunnumcondah, - - - - - - -	0	3	0
If brought by other ryots,			
Havalee, - - - - - - - - -	1	15	0
Paukhal Hussnabad, - - - - - -	1	11	3
Elgoor, - - - - - - - - -	0	3	3
Hunnumcondah, - - - - - - -	0	7	0
Land custom levied on tobacco coming from Masulipatam to Muttawarra and Ramnahpet Pergunna Havalee, if brought by the ryots of Ramnahpet and Muttawarrah, charge at the rate of three bullock loads, equal to 24 maunds on a cart,	4	15	6
Land custom levied on tobacco coming from Juggiahpet to Muttawarra, if brought by the ryots of Juggiahpet who reside at Ramnahpet if shopkeepers, charge at the rate of 3¾ bullock loads, equal to 30 maunds on a cart, - - -	12	11	0
If brought by the ryots of Juggiahpet not shopkeepers, charge at the rate of 3¾ bullock loads, equal to 30 maunds on a cart,	15	9	0
If brought by the ryots of Hunnumcondah, Muttawarra and Ramnahpet from Juggiahpet, charge at the rate of 3 bullock loads, equal to 24 maunds on a cart, - - - - - -	8	12	0
If brought by the ryots of Juggiahpet to Hunnumcondah and Muttawarra, charge at the rate of three bullock loads, equal to 24 maunds, - - - - - - - - - - -	7	15	0

Land custom levied on wheat and grain coming from Chanda

Dhunda Madapoor, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 2½ pullas on a cart,

Paukhal, - - - - - - - -	0	10	0
Chendragiri, - - - - - - -	0	9	0
Havalee, - - - - - - - -	0	6	0
Hunnumcondah, - - - - - -	0	1	6

If brought by the ryots of other Pergunnas not belonging to the Circar of Warungul, charge at the rate of three bullock loads, equal to 3 pullas on a cart,

Paukhal, - - - - - - - -	0	15	3
Chendragiri, - - - - - - - -	0	12	9
Havalee, - - - - - - - -	0	13	6
Hunnumcondah, - - - - - - -	0	3	6

Land customs levied on steel, lac, bees-wax and coosumba, Carthamus Tinctorius, coming from Chanda, Babapett and Madapoor, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,

Paukhal, - - - - - - - -	1	8	9
Chendragiri, - - - - - - -	1	3	9
Havalee, - - - - - - - -	1	3	3
Hunnumcondah, - - - - - -	0	3	9

If brought by other ryots, charge at the rate of three bullock loads, equal to 24 maunds on a cart,

Paukhal, - - - - - - - -	1	13	6
Chendragiri, - - - - - - -	1	3	9
Havalee, - - - - - - - -	1	3	3
Hunnumcondah, - - - - - -	0	7	0

Land customs levied on cotton coming from Babapett, for 1 bullock load. Land customs levied on the following articles coming from Juggiahpett—Cocoanuts, Tin, Brass, Copper, Lead, Katheel, Bellmetal, Pewter, Dry Ginger, Pepper, Cubebs, Long Pepper, Brimstone, Blue Vitriol, Mercury, Camphor, Salammoniac, Alum, Borax, Vermilion, Sulphur, Cloves, Cardamoms, Mace, Nutmeg, Cinnamon, Poppy-seeds, Aloes, Opium, Raisins, Corianderseeds, Turmeric, Soap, &c., if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,

Kothaguttoo, - - - - - - -	1	8	9
Vizianagrum, - - - - - - -	1	3	9
Havalee, - - - - - - - -	1	3	3
Hunnumcondah, - . - - - - -	0	3	0

If brought by other ryots, charge at the rate of three bullock loads, equal to 24 maunds on a cart,

Kothaguttoo, - - - - - - -	2	2	9

Vizianagrum, - - - - - - -	1	13	6
Havalee, - - - - - - - -	1	15	0
Hunnumcondah, - - - - - - -	0	7	0
Land custom levied on Ghee coming from Mungapett, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, or 20 maunds on a cart,			
Kothaguttoo, - - - - - -	1	8	9
Havalee, - - - - - -	1	3	3
Hunnumcondah, - - - - - -	0	3	0
If brought by other ryots, charge at the rate of three bullock loads, equal to 24 maunds on a cart,			
Kothaguttoo, - - - - - -	2	2	9
Havalee, - - - - - - -	1	15	0
Hunnumcondah, - - - - -	0	7	0
Land custom levied on Tusser, if brought by the ryots of Hunnumcondah, charge per piece, - - - - -	0	1	0
Silk-thread, by the ryots of Hunnumcondah, charge at 1½ seer,	0	3	0
Raw Silk, charge per maund, - - - - - -	2	0	0
Land custom levied on the following articles coming from Shumshahbad to Hunnumcondah—Assafœtida, Coffee, Sugar, Almonds, Plums, Dates, Cocoanuts, Mace, Cloves, Cardamom, Nutmeg, Brass, Copper, Tin, Pewter, Lead, Katheel, and Cloths, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,			
Vizianagrum, - - - - - -	1	3	9
Havalee, - - - - - - -	1	3	3
Hunnumcondah, - - - - -	0	3	0
If brought by other ryots, charge at the rate of 3 bullock loads, equal to 24 maunds on a cart,			
Vizianagrum, - - - - - -	1	13	6
Havalee, - - - - - - -	1	15	0
Hunnumcondah, - - - - -	0	7	0
Land custom levied on the following articles coming from Masulipatam to Hunnumcondah—Cocoanut, Clove, Cinnamon, Cardamom, Mace, Nutmeg, Almonds, Indigo, Chillies, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,			
Kothaguttoo, - - - - - -	1	8	9
Vizianagrum, - - - - - -	1	3	9
Havalee, - - - - - - -	1	3	3
Hunnumcondah, - - - - -	0	3	0
If brought by other ryots, charge at the rate of 3 bullock loads, equal to 24 maunds on a cart,			
Kothaguttoo, - - - - - -	2	2	9
Vizianagrum, - - - - - -	1	13	6

Havalee,	1	15	0
Hunnumcondah,	0	7	0
Land custom levied on salt coming from Masulipatam to Hunnumcondah by Bunnyahs, 100 bullock loads,	18	0	0
If brought by Pareka ryots, 100 bullock loads,	30	0	0
Land custom levied on cloths coming from Hyderabad to Hunnumcondah, 1 bullock load,	4	3	0
Land custom levied on the following cloths at Hunnumcondah coming from Masulipatam, Juggiahpet and Shumshahbad :			
Long cloth, per piece,	0	2	0
Barchop, do.	0	2	0
Red cloth, do.	0	6	0
White handkerchieves, each,	0	0	3
Mushroo, (Calcutta,)	0	1	0
Mushroo, (Aurungabad,) per piece,	0	2	0
Tusser,	0	1	6
Europe chintz, per piece,	0	1	0
Blue saree, each,	0	1	0
Soormaie, do.	0	1	0
Jaconet, per piece,	0	2	0
Madapalum,	0	2	0
Silk cloth, per piece,	0	1	0
Goomty, do.	0	1	0
Doria, do.	0	1	0
Carwa, do.	0	1	0
Woollen cloths, per yard,	0	0	6
Mullmull, per piece,	0	1	0
Cadee, do.	0	0	6
Agabanee, do.	0	1	0
Soosee, do.	0	1	0
Soosee Davaraconda,	0	2	0
Land custom levied at Ramnahpet and Muttawarra.			
Long cloth, per piece,	0	4	0
Barchop, do.	0	2	0
Red cloth, do.	0	6	0
Juggiahpet handkerchieves,	0	0	3
Murryalagherry do.	0	1	0
Muslin, per piece,	0	1	0
Mushroo, (Calcutta,)	0	1	0
Mushroo, (Aurungabad,)	0	2	0
Tusser,	0	1	0
Europe chintz, each,	0	1	6
Meelamber saru,	0	1	0
Jaconet, per piece,	0	2	0
Madapalum, do.	0	4	0

Cadee, per piece,	0	0	6
Agabanee, do.	0	1	6
Silk cloths, do.	0	1	0
Goomty, do.	0	1	0
Doria, do.	0	1	0
Carwa, do.	0	1	0
Soosee, do.	0	0	6
Soosee Davaraconda, do.	0	2	0
Woollen cloths, per yard,	0	0	6

No. 2.

List of articles produced and consumed in the Circar of Warungul, with the taxes levied on them.

Land custom levied on paddy, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 2½ pullas on a cart,

Kothaguttoo,	0	4	9
Vizianagrum,	0	5	3
Havalee,	0	3	0
Hunnumcondah,	0	0	9

If brought by other ryots not belonging to the Circar, charge at the rate of 3 bullock loads, equal to 3 pullas on a cart,

Kothaguttoo,	0	6	3
Vizianagrum,	0	7	6
Havalee,	0	6	9
Hunnumcondah,	0	1	9

Land custom levied on rice, wheat, grain, jowaree, moong, toor, cotton-thread, &c., if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 2½ pullas on a cart,

Havalee,	0	6	0
Vizianagrum,	0	6	6
Kothaguttoo,	0	4	3
Hunnumcondah,	0	1	6

If brought by other ryots not belonging to the Circar, charge at the rate of 3 bullock loads, equal to 3 pullas on a cart,

Havalee,	0	13	9
Vizianagrum,	0	15	3
Kothaguttoo,	0	12	9
Hunnumcondah,	0	3	6

Land custom levied on tamarind, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 2½ pullas on a cart,

Havalee,	0	6	0
Vizianagrum,	0	10	0

Kothaguttoo,	0	9	0
Hunnumcondah,	0	1	6
If brought by other ryots not belonging to the Circar, charge at the rate of 3 bullock loads, equal to 3 pullas on a cart,			
Havalee,	0	13	8
Vizianagrum,	0	15	3
Kothaguttoo,	0	12	9
Hunnumcondah,	0	3	6
Land custom levied on ghee, oil, honey, &c., if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,			
Havalee,	1	3	3
Vizianagrum,	1	3	9
Kothaguttoo,	1	8	9
Hunnumcondah,	0	3	0
If brought by the ryots not belonging to the Circar, charge at the rate of 3 bullock loads, equal to 24 maunds on a cart,			
Havalee,	1	15	0
Vizianagrum,	1	13	6
Kothaguttoo,	2	2	9
Hunnumcondah,	0	7	0
Indian madder, per maund,	0	1	0
Country coarse paper, 1 bullock load,	0	4	0
Land custom levied on Movah coming from Cooroova, if brought by the ryots of Hunnumcondah, charge at 2½ bullock loads, equal to 20 maunds on a cart,	3	9	3
If brought by other ryots not belonging to the Circar, charge at the rate of 3 bullock loads, equal to 24 maunds on a cart,	4	4	6
Land custom levied on iron coming from Tateecondah and Mulkanoor, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,	4	14	6
Land custom levied on Jaggery, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,			
Havalee,	0	11	0
Deetchcontah,	0	5	9
Elgoor,	0	2	6
Hunnumcondah,	0	3	0
If brought by other ryots not belonging to the Circar, charge at the rate of 3 bullock loads, equal to 24 maunds on a cart,			
Deetchcontah,	1	8	0
Havalee,	1	11	0
Elgoor,	0	3	3
Hunnumcondah,	0	7	0

Land custom levied on the following articles coming from Hussunpurty, Camalapoor, Rungapoor, Goodoor,			
Saree, per piece, - - - - - -	0	4	0
Saree, Silk, per piece, - - - - -	0	6	0
Cadee, do. - - - - - -	0	0	6
Cumblie, coarse, - - - - -	0	0	3
Dhovaitee, - - - - - - -	0	1	0
Land custom levied at Hunnumcondah and Muttawarrah on Cattle sold to any of the ryots,			
Bullock or Cow, - - - - - -	0	4	0
Buffaloe, - - - - - - -	0	4	0
Horse, - - - - - - -	0	1	0
Land custom levied on saltpetre, if brought by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 20 maunds on a cart,			
Havalee, - - - - - - -	1	3	3
Vizianagrum, - - - - - -	1	3	9
Hunnumcondah, - - - - - -	0	3	0
If brought by other ryots,			
Havalee, - - - - - -	1	15	0
Vizianagrum, - - - - - -	1	3	9
Hunnumcondah, - - - - - -	0	7	0

No. 3.

List of articles produced in the Circar of Warungul that are exported, with the duties levied on them.

Land custom levied on carpets passing through Nusscal to Hyderabad, at 40 in each bundle, - - - - -	1	8	0
Land custom levied on carpets passing through Cothacondah Hussnabad to Hyderabad, at 40 in each bundle, - -	2	0	0
Land custom levied on rice, jaggery, moong, toor, oil-seeds, &c., if carried by the ryots of Hunnumcondah, charge at the rate of 2½ bullock loads, equal to 2½ pullas on a cart,			
Hunnumcondah, - - - - -	0	1	6
Havalee, - - - - -	0	6	0
Vizianagrum, - - - - -	0	10	0
If carried by other ryots not belonging to the Circar, charge at the rate of 3 bullock loads, equal to 3 pullas on a cart,			
Hunnumcondah, - - - - -	0	3	6
Havalee, - - - - -	0	13	6
Vizianagrum, - - - - -	0	15	3

No. 4.

Articles passing through the Circar that pay land duty.

Land custom levied on Salt coming from Masulipatam to Hyderabad passing through Hunnumcondah and Vizianagrum, if

carried by Ajmeera Brinjaries for Roopa Naik, 100 bullock loads, - - - - - - - -	11	8	0
For others—100 bullock loads, - - - -	13	0	0
If carried by the Bhoja Konoosode, 100 bullock loads, -	14	8	0
Do. do. Roopa Cavedey, 100 bullock loads, -	14	8	0
Do. do. Bavasing, 100 bullock loads, - - -	11	8	0
Do. do. Lutchma Iatode, 100 bullock loads, -	12	8	0
If passing through Outapoor, carried by the Budavut Boda Brinjaries, 100 bullock loads, - - - -	8	14	0
If carried by the Koka Naik, 100 bullock loads, - -	8	2	0
Do. do. Mall lote Vallo Sunke, 100 bullock loads, -	8	14	0
Sunker Chowka Baunote, 100 bullock loads, - -	0	10	0
Land custom levied on Salt coming from Masulipatam to Elgondalah and Moolungoor passing through the Circar, 100 bullock loads, - - - - - -	39	11	0

Wages.—In towns wages are paid in money and in grain, in the country in grain, or in grain and money combined. Coarse paddy and *jowaree* are used for payment. In certain dear years, two seers of *jowaree* go for three seers of paddy, but in seasons of plenty they are reckoned of equal value. Since the force belonging to the contingent moved to Warungul, the wages of mechanics have risen from 50 to 100 per cent. while employed in cantonment, but this is no fair criterion of the rate throughout the Circar.

	Wages per Month.		
A man working in the field as a labourer receives two maunds of paddy or two to one and a half of jowaree per month with one rupee, if he chooses he may receive the whole in grain, and if he agrees for a money payment he gets rupees 2—8—0, from 3—0 to - - - - -	2	8	0
A woman or a boy working in the field receives three pice a day or a maund and a half of grain per month, - -	1	8	0
The Chuckler who assists at the Moat gets a pylee of grain a day and a bundle of unthreshed straw, - - -	0	0	0
All tradesmen as blacksmiths, carpenters, weavers, &c. get from 2 annas to 3 annas a day, from rupees 3—12 to -	5	0	0

Children who are much employed in carpet weaving at Mutwarrah owing to their fingers being more pliable than those of adults receive 3 pice a day.

Persons engaged in very hard work, such as the bellows-men in the manufacture of Iron, receive a pylee of grain and five pice a day. The woman who pounds the ore gets a pice a day in addition to the usual allowance of rice.

For weaving twelve yards of tusser the weaver gets rupees 4.

For dyeing three pounds of cotton or tusser the dyer receives one rupee.

Statistical Table of the Circar

	Villages and Hamlets.			Tanks and Wells.				Ploughs.			Cattle.		
	Inhabited.	Deserted.	Total.	In Repair.	Out of Repair.	Total.	Moats.	Rice.	Dry Grains.	Total.	Ploughing and Draught Cattle.	Other Cattle.	Total.
1. Havalee and Purkall.......,	94	16	110	702	752	1454	382	1035	979	2014	5409	36657	42066
2. Oopul,.....................	37	13	50	262	323	585	218	466	997	1463	3344	15722	19066
3. Chendragherry,.............	32	1	33	229	130	359	215	380	690	1070	2325	13172	15497
4. Kothagutta Kotajpoor,......	29	11	40	91	120	211	10	325	574	899	1672	12944	14616
5. Paukul and Husnàbad,.....	43	25	68	272	450	722	174	409	362	771	1723	10366	12089
6. Kothakondah Husnabad,. .	72	29	101	617	695	1312	683	1044	865	1909	5386	35895	41281
7. Vizianuggur and Valpecondah, ...	70	10	80	696	1047	1743	700	853	968	1821	4151	40264	44515
8. Bolicondah,................	31	11	42	408	296	704	493	630	385	1015	2034	18966	21000
9. Sumthamanium and Chellavoy,.................	45	19	64	97	63	160	9	619	225	844	1700	5926	7626
10. Gotipurthy,................	4	4	8	37	176	213	36	62	28	90	180	2593	2773
11. Yellgoor,..................	5	4	9	24	92	116	9	45	19	64	128	459	587
12. Koorva,....................	64	0	64	0	0	0	0	0	0	0	0	0	0
JAGHEER VILLAGES.													
Wurrungul Fort and Illintha,...................	2	0	2	41	47	88	47	37	70	107	292	2444	2736
Purgunnahs Husnabad, Valpecondah, and Oors Khajeepet,............	37	14	51	235	183	418	289	433	332	765	2034	17096	29130
Total..	565	157	722	3711	4374	8085	3265	6338	6494	12832	30378	212504	242882

Warungul, Souhah Hyderabad.

Carts.			Inhabitants.															
			Meerasdars.					Cultivators or Ryots.					Moturpha.					
Soucars.	For Hire.	Total.	Houses.	Men.	Women.	Children.	Total.	Houses.	Men.	Women.	Children.	Total.	Houses.	Men.	Women.	Children.	Total.
345	221	566	1201	1949	2005	1881	5835	1056	1975	2051	1591	5617	1941	3118	3393	3280	9791
153	38	191	565	996	1021	853	2870	915	1523	1557	1211	4291	803	1389	1442	1181	4012
112	73	185	450	844	816	833	2493	444	919	881	789	2589	500	887	843	841	2571
45	91	136	295	513	519	407	1439	477	916	912	682	2510	427	107	769	621	2097
39	20	59	363	540	575	571	1687	424	693	687	626	2006	616	879	990	986	2855
167	85	252	988	1622	1690	1576	4888	935	1698	1802	1482	4982	1545	2462	2495	2113	7070
40	13	53	1090	1623	1676	1526	4825	1051	1743	1849	1431	5023	1430	2284	2352	2204	6840
0	0	0	408	647	628	609	1884	418	703	755	682	2140	380	538	574	623	1735
0	50	50	244	362	373	301	1036	313	489	523	371	1383	765	1038	1145	854	3037
0	0	0	61	109	96	125	330	64	111	111	135	357	42	71	62	91	224
0	0	0	41	57	64	62	183	41	67	62	50	179	20	27	25	17	69
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	9	27	80	148	135	92	375	31	55	67	50	172	127	192	209	167	568
42	39	81	491	838	915	621	2372	307	480	469	349	1298	658	1115	1137	875	3127
961	639	1600	6277	10248	10512	9457	30217	6476	11372	11723	9452	32547	9259	14707	15436	13853	43996

Statistical Table of

	Inhabitants. Khooshbash.					Grand Total.					Amount of Produce, &c.		
	Houses.	Men.	Women.	Children.	Total.	Houses.	Men.	Women.	Children.	Total.	Land Revenue.		
1. Havalee and Purkall,....	1041	1544	1660	1546	1750	5239	8586	9109	8298	25993	29920	12	6
2. Oopul,...................	400	569	608	465	1642	2683	4477	4628	3710	12815	8234	12	9
3. Chendragherry,.........	343	522	481	468	1471	1737	3172	3021	2931	9124	4753	14	3
4. Kothagutta Kotajpoor,..	288	431	433	266	1130	1487	2567	2633	1976	7176	15420	13	0
5. Paukul and Husnabad,.	424	529	587	626	1742	1827	2641	2837	2812	8290	18238	7	3
6. Kothakondah Husnabad,	864	1327	1473	1067	3867	4332	7109	7460	6238	20807	29500	2	3
7. Vizianuggur and Valpecondah,.........	552	795	818	669	2282	4123	6445	6695	5830	18970	33682	6	0
8. Bolicondah,............	612	641	777	701	2119	1823	2529	2734	2615	7878	14351	14	0
9. Sumthamanium and Chellavoy,..........	218	322	304	273	899	1540	2211	2345	1799	6355	17889	7	9
10. Gotipurthy,.............	19	30	28	32	90	186	321	297	383	1001	2098	2	0
11. Yellgoor,................	18	22	21	13	56	120	173	172	142	487	2076	15	9
12. Koorva.................	0	0	0	0	0	0	0	0	0	0	0	0	0
JAGHEER VILLAGES.													
Warungul Fort and Illintha,...............	152	197	233	147	577	390	592	642	456	1690	770	8	8
Purgunnahs Husnabad Valpecondah and Oors Khajeepet,..........	833	432	473	361	1266	1789	2863	2994	2106	8065	10840	4	0
Total..	5264	7361	7896	6634	21891	27276	43688	45567	39396	*a* 128651	187778	8	2

a Hindoos—Men, Women, and Children,....123621 } 128651 Total.
Musselmen— Do. do. do. .... 5030 }

the Circar, &c. (continued.)

Amount of Produce, &c.												Gentoo Scholars.	English Scholars.
Moturpha.			Arrack & Toddy.			Town duty and Sevoy Jumma.			Grand Total.				
2342	4	6	5976	0	0	* 4222	3	6	43541	4	6	2	3
626	13	0	3016	9	3	* 8636	12	6	20514	15	6	0	0
484	0	0	2632	8	0	* 8477	0	0	16347	14	6	0	0
561	4	0	1154	6	0	78	0	0	17214	7	0	0	0
624	9	3	1816	2	0	* 4007	2	0	24686	4	6	0	0
2656	3	6	5224	8	3	* 2764	3	0	40148	1	0	1	1
1405	10	0	6808	4	0	506	2	0	42402	6	0	2	2
270	3	0	2065	0	0	357	0	0	17044	1	0	2	0
811	2	0	1233	6	0	* 2008	3	3	21942	3	0	1	0
95	8	0	306	0	0	46	0	0	2545	10	0	0	0
9	0	0	72	0	0	2	13	3	2161	1	0	0	0
0	0	0	0	0	0	0	0	0	3000	0	0	0	0
100	0	0	214	0	0	700	0	0	1784	8	8	0	0
1194	12	0	2255	4	0	* 3355	7	6	17625	11	6	3	0
12264	5	3	32774	3	6	35141	7	0	270958	8	2	11	6

Remarks.

In the village returns two kinds of carts are noted—Soucars carts and carts for hire.

Soucars carts—meaning the conveyances belonging to money-lenders, and the wealthier classes generally, who employ them in carting in produce from the fields, and for purposes of traffic.

Meerasdars—The same meaning is attached to this term, as in other parts of India, but certain tradesmen, particularly goldsmiths, are sometimes reckoned Meerasdars, and sometimes are rent-payers.

Khooshbash includes Brahmins, certain privileged classes of Coonbees, Yellamas, Mahometans, &c. They have their lands at a lighter rent than the common Coonbees.

Moturpha includes shopkeepers generally, and all those not engaged in agriculture, who pay a house or shop-tax to Government; it answers to the Pandru of other parts of India.

Kullalee is the revenue derived from the drawing, preparation, and sale of intoxicating liquors.

Town duty is levied in some of the larger villages, it is a certain duty on grain, tobacco, goor, &c. introduced into the village.

Sevoy or Sevaee Jummah is made up of a number of small taxes levied by the village authorities, as taxes on tamarind trees, mangoes and custard apples, fines on marriages, processions, payment from fishermen, &c.

* Such is the general meaning of the term, but in some Pergunnahs the money rents are mixed up with the tax.

II.—*On the Fresh Water Fishes of Southern India. By* T. C. Jerdon, Esq., *Assistant Surgeon, Madras Establishment.* *(Continued from p. 149.)*

[I beg to observe that in my measurements of the relative proportions of head and depth of fish to the *length*, I take the length only as far as the *base of the caudal fin.* I believe that Cuvier and McLelland measure to the *end* of the caudal fin, but as this is apt to vary somewhat, and moreover very liable to injury, I think the other mode is preferable.]

Ord. Malacopterygii.

Fam. *Cyprinidæ.*

Dorsal fin single, of few rays; maxillary teeth minute, or wanting; mouth (typically) small.

In this numerous family I shall follow nearly the arrangement given by McLelland in his most valuable Monograph of the group, (Asiatic Researches, vol. 19th,) which I consider infinitely superior to that of Valenciennes.

Gen. *Cyprinus.*

Body elevated; dorsal fin usually long, preceded by spinous rays; no cirri; lower jaw short.

Cyprinus kontius. (New Species.)

Muzzle blunt, truncated; snout with mucous pores, head small; profile rising abruptly to front of dorsal, thence gradually drooping; dorsal fin high in front, low behind, with spines, the third strong, broad, simple. D. 3-12, A. 2-6. Colour dusky greenish, brighter beneath; fins dashed with reddish—38 or 39 scales along the lateral line in 13 rows.

I have found this fish (which is the only one appertaining to true Cyprinus in S. India) in the Cavery and its tributaries, growing, it is said, to a considerable size; my specimens were only a foot long.

* *C. potail.* Sykes.

"Deep and fleshy, slightly compressed, dorsal fin of 13 rays, pectoral of 14, and anal of 9—scales large and silvery, length 10 or more inches, height $3\frac{1}{4}$ inches."

This fish, judging from the above brief description, appears to me to be a true *Cyprinus*—I have great doubts where to place the next.

* *C? nukta.* Sykes.

"Two tendrils on under jaw, and two short horns on the space between the eyes, which, together with the deflected upper lip, are tuberculated; large scales. Found in the Inderanee river 18 miles north of Poona."

Gen. *Cirrhinus.*

Dorsal fin usually long, without spinous rays; lips with 4 cirri (generally.)

This genus, as above defined, includes the *Rohita* and *Dangila* of Valenciennes; the *Cirrhina* of the same author appears to belong partly to this genus, and partly to *Gobio.*

Cirrhinus rubro-punctatus. (New Species.)

Cirri minute; head is to the body as 1 to $4\frac{1}{2}$; the height is to the total length as 1 to 3; 40 scales along the lateral line in 15 rows.

D. 15, A. 8, greenish above, dusky silvery beneath, many of the scales in the centre of the body red spotted; fins red tipped.

I procured this handsome fish in the upper portion of the Cavery river, and in several of its tributaries. My specimens are about a foot long. It is said to grow to a larger size however.

Cirrhinus Belangeri?

Rohita Belangeri, Val., olim *Cirrhina micropogon.*

Cirri rather small; head is to the body as 1 to $4\frac{2}{3}$; its height is to its total length as 1 to $3\frac{1}{2}$; 45 or 46 scales along the body in 15 or 16 rows; D. 2-15, A. 2-5, &c. Color dusky green throughout, many of the scales red spotted; fins dark.

I have found this fish in most of the rivers and large tanks of the Carnatic; my specimens are about 14 inches long, but it is said to grow much larger. It answers so nearly to the description of Valenciennes' fish that I have for the present retained it under that name, though his fish was said to be procured from Bengal. If so it can hardly have escaped Buchanan and McLelland, yet I can find none in the latter author that answer to it, so the locality given is probably erroneous.

Cirrhinus affinis. (New Species?)

Nearly allied to the last; cirri long; 39 scales along the body in 12 rows; snout very warty; D. 17, A. 7. Dusky green through-

out. I procured a single specimen of this fish in the Cavery at Seringapatam, but do not now possess it. It is called *Kum-min* by the fishermen there.

† *Cirrhinus Cuvierii.*

Dangila Leschenaultii. Val.

Labial cirrus fine, maxillary one fleshy; both short; body elongated; head short, one-sixth of total length of body; height $5\frac{1}{2}$ times in length; eye large; 40 scales along the body; greenish above, silvery beneath; D. 3-13, A. 3-5—fins yellowish.

I procured what I imagine to be this fish from the neighbourhood of Madras. Valenciennes' specimens were from Pondicherry. He places it as a *Dangila*, a genus he characterizes as having an edging of conic papillæ on the upper lip.

* *Cirrhinus Dussumierii.*

Rohita Dussumierii. Val.

Body elongated, its height being $4\frac{2}{3}$ in its total length; head one-sixth of length; muzzle rounded, with a few large pores; cirri small; lips fringed; 60 scales along the body. D. 3-13, A. 3-5—greenish yellow above, silvery beneath, fins with a greenish tinge, $10\frac{1}{2}$ inches long.

I have not yet seen this fish, which is said to have been brought from the neighbourhood of Alipey in Travancore. It has smaller scales than most of the genus.

* *Cirrhinus Rouxii.* Val. *Rohita.* Val.

Cirri very short; caudal much forked, 46 scales along the body; D. 3-12, A. 3-5. Steel blue on the back; silvery iron grey beneath, fins dusky—6 inches long. Said to have been brought from Bombay. I have not seen it.

* *Cirrhinus fimbriatus.* Bloch.

Rohita. Val.

Cirri very minute; head short, broad, five times and one-third in the total length; many mucous pores on the snout, which is rounded; height of body one quarter its length; 45 scales along the body. D. 3-16, A. 2-8, from Pondicherry.

I do not know this fish.

† Name changed in consequence of there being also a *Rohita Leschenaultii*, which is a *Cirrhinus* apud nos.

I imagine that the following fish of Sykes' list should be placed in this genus.

* *Cyprinus Abramioides.* Sykes.

20 rays in dorsal, 8 in anal, 18 in pectoral fins, without tendrils, with tuberculated nose, red edged fins and a red lunule on each scale; attains the length of 21 inches and height of 7—excellent eating; called *Tambra* by the natives, from the general prevalence of a copper colour.

* *Cirrhinus Blochii.* C. V.

Cyp. cirrhosus, Bloch. 411.

Cirri rather long; dorsal pointed; scales rather large; lateral line straight; of a dark violet colour above, silvery beneath, fins transparent. D. 18, A. 13, up to 1½ feet long.

From the rivers and lakes of the Malabar Coast.

There is another fish, which is described by Valenciennes, whose locality is not mentioned, but as it was procured by Leschenault, who collected much in the South of India, it may be from Pondicherry, or the Malabar Coast.

* *Cirrhinus Leschenaultii.*

Rohita Leschenaultii. Val.

Cirri very short; height one-third of length; head 5½ times in total length; end of muzzle round, thick, covered with mucous pores; dorsal fin low; 45 scales on body—7 inches long D. 3-16, A. 3-5.

The next species to be mentioned is one of Sykes', which may either belong to this genus or be a *Gobio.* Colonel Sykes places it as *Varicorhinus Bobree.* "Nose tuberculated; no tendrils—D. 17, A. 8, form of a tench; lips thick, fleshy, frequently crenated, 6 inches long, $1\frac{6}{10}$ high."

The last of this genus, if indeed it belong here, is a small fish that appears somewhat allied to *C. joalius*, *C. morala*, *C. dero*, &c. &c. by its dark bands. It, with some of these, will probably form a subdivision.

Cirrhinus fasciatus. (New Species.)

Snout covered with mucous pores; cirri very long and thin, head large, being to the body as 1 to 4½; height 2⅔ of total length; scales 20 along the sides, in 6 rows. D. 11, A. 6 or 7—2½ to 3

inches long. Color reddish yellow, with 4 black bands, sometimes interrupted, on the sides; viz., one behind eye, one beneath the dorsal fin, another between the dorsal and caudal fins, and the fourth close to the tail.

This is an active little fish found in small shoals in all the streams of Malabar beyond the reach of the tides, and in the higher branches of the streams that run into the Cavery. It lives chiefly on vegetable matter, but will also take worms, &c. I have kept it alive for some months, and I observed it to be extremely active and pugnacious.

Gen. *Gobio.*

Dorsal fin short, placed opposite the ventral, without spines; lips thin; lower jaw shortest; some have 2 cirri, others entirely without them.

Gobio curmuca. (Buch.)

Head very long, being one-fourth of the length of the whole body, furnished with some mucous pores on its snout; 2 long cirri; eye distant from muzzle; 40 scales along its body, with 12 rows in its depth, D. 11, A. 8. Color green above, silvery beneath. Dorsal and pectoral fins, reddish white; ventral colourless, with the two first rays reddish; anal colourless; tail greenish, lips bright orange, ended and margined with black.

My specimens correspond so exactly with Buchanan's figure that I cannot doubt their identity; but I imagine that he has either made some error about its locality, or has confounded two allied species. My specimens are from the rivers of Palghat, and Ariacode in South Malabar, where it is very common, and I have as yet seen it in no other locality, and certainly it is not a common fish in Mysore or I must have seen it. Buchanan I may mention passed over the very locality whence my specimens were obtained in his journey through Mysore, &c. and might probably have had his drawing taken there, and made his description from some other species. The orange and black tipped caudal seems to be a permanent mark, as I have seen it in fish 2 inches long, and in all up to a foot and more.

Gobio Canarensis. (New Species.)

Very closely allied to the last; appears to differ in its shorter head, which is to the whole length as 1 to $4\frac{1}{2}$; its depth is as 1 to $3\frac{1}{2}$. The distance of eye from muzzle is less. Color green above, golden

on the sides, silvery beneath; dorsal, ventral and anal fins yellow orange; tail yellow, margined with orange above and below, and with a broad fringe of black on its posterior margin; pectoral pale yellowish.

D. 12, A. 7.—My specimen was destroyed before I counted the number of its scales, but the points noted above, and the difference in the colours have induced me to consider it distinct from the last. I found it in rivers in Canara, and my specimen was about 8 inches long.

Gobio Hamiltonii. (New Species?)

Head to whole length of body as 1 to 4⅔, D. 11, A. 7, 40 scales along the body and 10 or 11 in its depth. Green above, silvery beneath; snout concave between eye and muzzle. Dorsal and anal fins colorless; pectoral and ventrals, orange margined; caudal pale yellow.

This fish, of which I procured some small specimens, 5 or 6 inches long, in the Cavery and its tributaries, is also very closely allied to *C. curmuca*, and may have been mistaken for the Malabar fish by Buchanan, and the description taken from it. I did not notice any cirri in this or the last, but they may exist notwithstanding, as my only specimen of the first was destroyed, and my present one is in such bad order that I cannot make them out. I am strengthened in the supposition of my present species not having cirri by having lately obtained in the Bhowany, a tributary of the Cavery, a large *Gobio* which may be identical with it, but of which unfortunately I lost my only specimen. It was of large size 20 inches long, head small, being to the rest of the body as 1 to 5; height to length as 1 to 3½; 39 or 40 scales along the body in 11 rows D. 11, two first rays quite simple. A 7, green above, silvery on the sides and beneath; all the fins dusky, edged with red. Should, on a further comparison, this be found a distinct one I propose the name of *Gobio Bovanius*—either this or the last however are possibly *Gobio ariza*, Buch., described as having snout and under lip smooth, 12 rays in dorsal, in other respects *like the last*, (*C. pargusia*). Another allied form is one I shall provisionally call,

Gobio augraoides. (New Species.)

Head small, no cirri; length of head to body as 1 to 5¼—depth to total length as 1 to 3; 44 scales along the body and 12 across;

D. 13, A. 7. Colors dark blueish above, golden on the sides, with a dark streak from eye to tail ; all the fins dark ; pectoral, ventral, and anal, tinged reddish yellow; profile rising rapidly to the dorsal ; eye near the snout ; mouth quite inferior. Its mode of colouring reminds one of *Gobio augra* of Buchanan, and also of *G. bicolor* of McLelland, but it is very distinct.

Gobio bangon. Buch. ?

Head is to the body as 1 to $4\frac{3}{4}$; height to total length as 1 to 4 ; 38 scales along the body and 11 or 12 across ; D. 10, A. 7. Yellowish green above, with greenish longitudinal lines ; silvery beneath ; fins greyish yellow, sometimes tinged reddish, snout porous. This is undoubtedly the *arja* or *arija* of the Mysore fishermen, from which Buchanan must have taken the name *ariza*, but the species he has called by that name is very evidently distinct from this form. Whether my fish be identical with *C. bangon* or not, must be determined hereafter. It is very abundant in the Cavery and its tributaries, and becomes more so as the river becomes more sluggish.

Gobio limnophilus. McLelland.

Very closely allied to the last, and perhaps indeed identical, as McLelland has hinted. 36 scales along the sides and 12 across ; 2 small cirri; D. 10, A. 6 ; reddish yellow above, silvery beneath ; fins dusky greenish yellow—head little more than a sixth of total length of body ; depth to length as 1 to $4\frac{1}{2}$ or 5. From tanks and rivers near Madras, and other parts of the Carnatic. I am not very certain about the cirri, but I think that they exist.

Gobio Dussumierii.
Cirrhinus Dussumierii. C. V.

Head small, 6 times in the total length, height of body 4 times ; muzzle thick truncated, 2 short cirri ; line of back almost straight ; abdomen much rounded; eye 4 times in the head—D. 3-8, A. 2-4—39 scales along the sides in 15 rows—from Mysore. This is perhaps the same as my *G. bangon*, or very closely allied to it.

I cannot help imagining that the following fishes of Colonel Sykes' list belong to the present genus.

* *Chondrastoma kaverus.* Sykes.

No lateral line, no tubercles no cirri—sub-cylindrical—D. 12, A. 8,—up to 1 foot in length—Beema river.

* *Ch. fulungec.*

Elongated, not much compressed, D. 10, A. 6, length 1 foot, height 4 inches.

* *Ch. boggut.*

No tendrils, nor tubercles, body elongated, D. 12, A. 8, length 11 inches.

* *Ch. mullya.*

Short obtuse head, sub-cylindric body, and a red process on snout. D. 11, A. 8, length 6.

* *Ch. wattanah.*

Body elongated, dorsal high, form sub-cylindric. D. 11, A. 8, length 4¼ inches.

Gen. *Oreinus.* McLelland.

Head fleshy, mouth vertical, lower jaw shorter than the upper; snout muscular and projecting, furnished with cirri; dorsal preceded by a serrated spinous ray; scales small.

I have not seen any fish in Southern India that appertains to this genus, but I apprehend that one of Colonel Sykes' list may belong to it, viz., *Rohtee paugut*—Sykes, of which the following are the characteristics—compressed, deep, angular-backed,—D. 12, A. 8; first 3 or 4 rays of dorsal black tipped; length 5 inches, height 1¼. In Baum and Beema rivers. Colonel Sykes' genus *Rohtee* is described as having longish dorsal and anal fins, the 1st complete ray serrated posteriorly, scales minute, &c. but includes two fish that I think must be breams, and one *Opsarius* apparently.

Gen. *Gonorhynchus.*

Mouth beneath; head covered with thick integuments; snout perforated by numerous mucous pores; body sub-cylindrical; dorsal and anal short, no spines.

G. Gotyla, Gray.

4 small cirri; snout thick, divided by a deep transverse fissure, covered with prominent mucous pores; head is to the whole body as 1 to 5¼; the height of the body is 4½ times in its length; 34 scales along the body in 7 rows; colour dark olive green above, yellowish beneath, some of the scales red edged; fins yellowish green, tipped with orange. D. 2-8, A. 7—length about 8 or 9 inches.

I cannot of course be certain that my fish is the same as the one figured in Gray and Hardwicke's Illustrations, said to be from the mountains of India, but which McLelland does not appear to have met with. Should the fish figured by Gray be from the North of India, mine is probably distinct, but it is possible that Buchanan may have obtained it, and had a drawing taken, from the same locality as I did, whence Mr. Gray might have obtained his copy. The only point of difference of any note is the fleshy pendulous point said to exist at each corner of the mouth, which I do not observe in mine, and which may be an exaggerated defect of the original drawing. My fish was obtained in the Bhowany river, at the foot of the Neilgherries, and also in the Manantoddy river, both tributaries of the Cavery. It is only found where the bed of the river is stony, and keeps always close to the bottom, living apparently on the vegetable matter adhering to the stones. This and the other species are called *Kul korave* by the Telingas.

Gonorhynchus McLellandi. (New Species.)

Snout covered with numerous pores; profile rising to the dorsal, slightly concave from that to the tail,—head is to the whole body as 1 to 4½, height is 3⅔ in its total length; 2 longish cirri, head depressed in front, dorsal fin rather high. D. 10, A. 7, &c.—colour dusky green above, golden on sides, and greenish white beneath; caudal fin green in the centre, reddish above and below; other fins yellow, edged with red; cheeks golden, 36 scales along the body in 9 rows. Length 10 inches.

Found in the same localities as the last.

Gonorh. stenorhynchus. (New Species.)

Muzzle more acute than in the last, ending in a blunt rounded projection studded with large and prominent mucous pores; 4 longish cirri; head is to the whole body as 1 to 4¼, height is 4 times in the length; 34 scales along the body in 7 rows; D. 10, A. 9, &c. About 10 inches long. Colours much as in the last.

I have only found this well marked species in the Bhowany river at the foot of the Neilgherry hills.

I have got some small specimen of a species of this group from the streams of Malabar, which I cannot at present separate from *G.*

McLellandi by sufficiently specific characters, but of the distinctness of which I entertain little doubt, and hope to settle the question shortly.

Gen. *Barbus.*

Dorsal short, preceded by a strong spine ; 4 cirri.

Barbus (Labeobarbus) Hamiltonii. (Gray.)

Barbus progeneius. McLell.

Head to the whole body as 1 to $3\frac{1}{2}$; cirri long ; a fleshy projection on both upper and lower lips ; body compressed ; its height is to total length as 1 to $3\frac{1}{4}$—26 scales along the lateral line, in 6 rows; green above, cheeks golden, silvery beneath; fins tinged with orange red; D. 3-9, 3d spine simple, very strong ; A. 2-5, &c.

This fine fish is one which in the South of India most nearly resembles the *Mahseers* of Bengal, but I am not aware of its having been taken by fly here. It is found in the Cavery and all its tributaries, and grows to a size I am told, of 2 to 3 feet. It is a very handsome fish. I am not certain of its being McLelland's fish, which appears to differ somewhat in colouring, in the size of the head, and in wanting the projection on the upper lip. The drawing in Gray and Hardwicke gives a very fair representation of our southern fish.

Barbus Megalepis. McLell. ?

Cyprinus mosal. Ham.

Head is to the body as 1 to 3; 25 scales along the side in 6 rows ; D. 12, A. 7.

I obtained a single small specimen of what I consider may be this fish in the Cavery at Seringapatam. It was only a few inches long, but the fishermen, who call it *kilche,* said that it grew to an enormous size.

Barbus Carnaticus. (New Species.)

Head small, being rather more than one-fifth of whole body; obtuse ; body not much compressed, eye about one-fourth the length of the head. It has about 32 scales along the sides in 8 rows, cirri of moderate length ; profile of back ascending to the dorsal ; dark glassy olive green above, silvery beneath ; fins yellowish dusky ; D. 4-8, A. 7, spine stout, simple.

I cannot find the description of this fish among those of McLel-

land or Hamilton, and accordingly have named it as new. It is found in the Cavery and all its tributaries, frequenting the streams, and rising to the fly.

I have heard of some fine fish of this species having been taken in the Bhowany at the foot of the Neilgherries, and in other parts of the country. It is called *gendé* by the Seringapatam fishermen. It grows to 3 feet and more in length, and is then a very heavy fish.

Barbus sarana. C. and V.

Head is to the whole body as 1 to $4\frac{1}{2}$; height is to the length as 1 to 3 ; head blunt, cirri slender ; 28 scales along the sides in 8 or 9 rows ; D. 2-8, A. 7 ; 2d dorsal fin finely serrated behind, and ending in a soft point ; blueish above, rest of the body yellowish ; cheeks golden, fins yellowish.

I have very little doubt but that this fish is Russell's *kunamoo* as Buchanan suggests, but which McLelland appears to doubt. It is extensively distributed over Southern India, being found in all the rivers, and most of the larger tanks of South India. It grows to the length of about 2 feet, and is called *panjiri* by the fishermen of Seringapatam. I have not seen it from the rivers of the West coast. It appears not to have been seen by McLelland.

Barbus Malabaricus. (New Species.)

Head to whole body as 1 to 4 ; height $3\frac{1}{2}$ times in its length ; 4 long cirri ; 23 scales along the body in 6 rows. D. 3-8, A. 2-8 ; pale brownish olive above, silvery beneath ; fins tinged with red.

I would have considered this fish without doubt as *B. roseipinnis* of C. V., but that is said to have the dorsal spine serrated, &c. I have taken this handsome barbel only in mountain streams in Malabar. It rises to the fly sometimes, and will also take a bait of boiled rice. I have not seen it more than 10 inches long, but from the rapid growth of one I have kept alive for some months I imagine it attains a much larger size.

Barbus Mysorensis. (New Species.)

Head is one-fourth the length of the whole body, height is $3\frac{1}{2}$ times in its length ; snout prominent, raised, covered with mucous pores ; 4 long cirri, 38 scales along the lateral line and 9 rows ; D. 4-9, A. 7, &c. ; dark dusky greenish above, golden on the cheeks and sides,

and the fins stained with red. I have found this barbel in the Cavery and its tributaries, and it is said to grow to a large size.

Barbus gracilis. (New Species.)

Head one-fourth of body; height 4¼ times in its length; snout smooth, very protractile, 4 long cirri, 42 scales along the sides in 12 rows; D. 4-9, A. 7, &c.; 4th dorsal spine very ending in a soft point; pale greenish yellow above, silvery on the sides and beneath; fins yellowish.

This is a very well defined species found in the same localities as the last, it is said not to grow larger than 12 or 15 inches.

Colonel Sykes has 2 barbels which may be identical with some of the foregoing supposed new species, but in the absence of more detailed information, I must place them as distinct.

**Barbus massalah.* Sykes.

4 short cirri, nose tuberculated; D. 12, A. 8, up to 3 feet long and 1 foot high. In the Goreh river.

**Barbus khudree.* Sykes.

4 cirri, large hexagonal scales, body elongated, D. 14, A. 7, fins blood stained. In Mota Mola river.

If Colonel Sykes had not given 14 rays to the dorsal fin I might have considered it the same as *B. Hamiltonii.*

**Barbus subnasutus.* C. V.

Head one-fifth of total length; eyes small; muzzle smooth; height three times and a third on the total length; 29 scales along the side in 12 rows; D. 3-8, spine serrated; A. 8, &c.; said to be from Pondicherry, nearly 6 inches long.

**B. gibbosus.* C. V.

Head small, one-sixth of total length; height three and a half times in its length, eye one-fourth of head; 29 scales along the body in 12 rows; D. 4-8, A. 3-5, spine serrated; from Alipey, brought by M. Dussumier.

**Barbus gardonides.* Val.

Head five and a half times in total length; height not quite three and a half times in the same; eye 3½ times in length of head; cirri

small; 31 scales along the sides in 12 rows; D. 4-8, A. 8, &c.; dorsal ray serrated—from Bombay and Calcutta, &c.

The three preceding fish appear to be somewhat similar to one another, and most probably belong to the genus *Systomus* of McLelland.

I cannot identify them however with any of mine.

**Barbus roseipinnis.* C. V.

Cirri long, thin; toothed dorsal ray slightly bent, of moderate size; eye large;, 22 scales along the side; D. 3-8, A. 2-5, &c.; caudal, anal, and ventral fins strongly tinged with red—4½ inches long—from Pondicherry.

**Barbus Polydori.* C. V.

Dorsal spine very finely serrated, slender; 27 scales along the sides. D. 3-9, A. 2-5. Steel blue on the back, silvery beneath, fins greyish; 4½ inches long, from Bombay.

It is probable that these two belong also to the *Systomi.*

Genus *Systomus.* McLelland.

Dorsal and anal fins short, the former usually preceded by a spinous ray; intermaxillaries protractile; spots on body, or fins.

Systomus chrysopoma. Val.

Head 4½ times in total length; height 3½ times in the same; 4 cirri; 27 scales along the sides in 10 or 11 rows; D. 10, A. 8. Green above silvery beneath, cheeks golden, a black spot on each side of the tail—up to 1 foot long.

This fish, placed as a *Barbus* by Valenciennes, is probably nearly allied to the *S. immaculatus* of McLelland. It sometimes wants the black spot on the tail. It is very abundant in most of the rivers of Malabar, entering the ditches and paddy fields during the monsoon in great numbers, and is caught by the boys with a hook baited with worm. It is more nearly allied to the Barbels perhaps than most of the *Systomi.* I have kept it in confinement for many months and it grows very rapidly.

Systomus dorsalis. New Species.

Head is 3½ times in total length; height is 3 times in the same; snout irregular, 26 scales along the sides in 8 rows; 2 labial cirri; profile rising to dorsal and descending rapidly to the end of that fin,

thence nearly straight; blueish above, yellowish on the sides, silvery baneath, a black spot on each side of the tail occasionally; fins with a yellowish tinge; D. 3-8, A. 7, &c. Dorsal fin with a black spot on its base behind; 4 to 5 inches long.

This fish is common in all the tanks and rivers in the neighbourhood of Madras, and I have not seen it elsewhere. It is probably a *Capoeta* of Valenciennes.

Systomus amphibius. Val. ?

Height one quarter of total length; a pair of very small labial cirri; 25 scales along the sides. D. 3-8, A. 7, &c.; 4½ inches long; color green above, silvery beneath, with a fine rosy streak from eye to the tail along the centre of the body over the lateral line; fins with a yellowish tinge; sometimes has a black spot on each side of the tail.

This fish, or what I take to be it, has been placed by Valenciennes in his genus *Capoeta*, which he separates from the Barbels on account of having only 2 cirri. They form in Southern India a group of very nearly allied fish, difficult to distinguish *inter se*, and too closely joined to other species of *Systomus* without cirri, to permit us to retain them distinct. Our present fish I have procured in the Cavery, and also in tanks in Mysore and the Carnatic.

In some tanks it is found in great numbers. Cuvier's figure is defective, inasmuch as it shows the spine serrated, which, however, in the letter press is said to be entire. As to its being said to inhabit the sea at Bombay, only coming into the paddy fields during the inundations, I cannot help thinking there must be some mistake. It is mentioned by Valenciennes as being found even one foot long. If this is the case I imagine our southern fish will prove distinct. I have seldom seen it above 3 or 4 inches.

Systomus Carnaticus. (New Species.)

Very closely allied to the last. Differs in having much longer cirri, in its dorsal fin being lower, and having only 2 instead of 3 entire rays; lateral line more curved, scales 24 along the sides in 7 rows; blueish green above, yellowish on the cheeks and sides, and reddish beneath, a large black spot on each side of the tail; dorsal fin reddish, stained with black; other fins pale yellow. Length about 3½ to 4 inches.

I obtained specimens of this fish in the Bhowany river at the foot of the Neilgherries and also in the Cavery.

Systomus sophone. (Buch. ?)

No cirri; dorsal spine smooth; head is 4 times in body and its height is 2 times and two-thirds its total length—D. 10, A. 7—dusky green above, cheeks orange, silvery beneath; a streak of fine red along the sides; dorsal fin sometimes stained with black; usually a black spot on the tail; ventral and anal fins often tinged with red; dorsal spine smooth; 23 scales along the sides in 9 rows.

Common in tanks and rivers in the Carnatic not exceeding usually $3\frac{1}{2}$ or 4 inches.

Systomus chola. (Buch. ?)

2 cirri; 24 scales in 9 rows—D. 10, A. 7—dorsal spine smooth, green above, silvery beneath. Dorsal fin reddish, stained and spotted with black; other fins yellowish; a large black spot on the root of the tail; cheeks golden; height about $2\frac{1}{2}$ times in the length; head $3\frac{1}{2}$ times in body, length about $3\frac{1}{2}$ to 4 inches.

Although my fish, which is from tanks in the Carnatic, has some points of resemblance to *C. chola*, I have little doubt that it is distinct, and in that case propose the name of *Hamiltonii.* Its chief points of difference are the less depth, large head, &c. It differs from *sophone* chiefly in having cirri; I possess notes of another allied species which differs from *S. sophone* in its more elongated body. 24 scales in 7 or 8 rows; and usually no spot on the tail; but as I have lost my specimen, I shall only allude to it here. It was from Madras.

Systomus tristis. (New Species.)

2 cirri; 24 scales along the sides in 7 rows; D. 4-8, A. 7, &c.; body compressed; plain olive green above, silvery beneath; fins plain, 3 inches long.

I procured a single specimen of this fish in the Cavery, which I at first took to be a *Barbus*, and indeed it resembles one so much in habit, dorsal spines, plain colours, &c., that I may yet be mistaken, but I could only detect 2 cirri.

Systomus tripunctatus. (New Species.)

No cirri, head about $3\frac{1}{2}$ times in length of body; height about $3\frac{1}{4}$ times in the length; 23 scales along the sides in 7 rows. Green

above, golden beneath; 2 black spots under end of dorsal, and another at base of tail; length about 2 inches. D. 10, A. 7, &c.

I procured specimens of this little species in a small stream near the coast in Canara, and have seen it no where else.

Systomus conchonius. (Buch. ?)

Body rather arched beneath, its depth 2½ times in the length; head 5 times in total length; 2nd dorsal spine strongly serrated, not so long as the next soft ray; green above, silvery beneath, fins yellowish; 25 scales along the body in 8 or 9 rows. D. 2-8, A. 7, 2 inches long.

This little fish from tanks near Madras answers so nearly to the description of *C. conchonius*, that I have retained it under that name, although that species is from the Northern parts of Bengal.

Systomus arulius. (New Species.)

Head 3¼ times in length; depth 2½ times in the same; eye large; 20 scales along the sides in 6 rows—D. 10, A. 7—green above, silvery beneath; a large diffused black spot on side beneath the commencement of the dorsal, another over the anal, and another at base of caudal; dorsal, caudal and anal fins red; P. and V. colourless; in the older subjects the spots extend more over the sides, length 4 inches.

Found in the Cavery, called *arŭli* at Seringapatam.

Systomus rubro-tinctus. (New Species.)

No cirri; head about 4 times in total length; depth about 2½ times; scales 20 along the sides in 7 rows—D. 2-8, A. 7—green above, cheeks golden, silvery beneath; 3 small black spots on sides, one under dorsal, the 2nd over the anal and the 3rd near base of caudal, between the 1st and 2nd spots a series of bright red spots; dorsal, anal, and caudal fins red, the latter edged externally with yellow.

About 5 inches long, I procured this fish in the Manantoddy river, a tributary of the Cavery.

Systomus stigma. (Val.) ?

Head about 4 times in length; height 3¼ times in the same. 23 scales along the sides in 5 rows—D. 10, A. 7—green, with a yellow

streak along the sides; belly, as far as vent, bright silvery; 2 black spots on the dorsal, and another at base of caudal, 2 inches long.

From tanks in Mysore.

It appears to me very probable that this is the *Leuciscus stigma* of Valenciennes. Should it prove distinct I would propose the name of *S. vittatus*.

* *Systomus ticto.* (Buch.)

Rohtee ticto. Sykes.

"A Rohtee 1⅔ inch long, with 4 to 6 black spots on the body; 2nd ray of the dorsal toothed behind, with sharp incurved teeth, with 10 rays in the dorsal, 8 in the anal; pectoral fin narrow, accuminate.

Found in the Mota Mola near Poona."

This may be an *Opsarius.*

* *Systomus sulphureus.* (Val.)?

Profile of back and abdomen regular, very slightly arched; height one-third of length; spinous ray of dorsal not toothed; eye nearly one-third of length of head—D. 10, A. 7—pale sulphur colored with silvery reflections. From Mysore. 4 inches long. I have not identified this species, which, placed by Valenciennes among his *Leucisci* near *L. stigma*, appears certainly to be a *Systomus.*

Systomus filamentosus. (Val.)

Head 4½ times in body; height about 2½ times; eye 3½ times in the length of the head; 2nd dorsal spine simple, strong; 1st, 2nd, 3rd and 4th soft rays prolonged to nearly double the height of the others; 5th not quite so long—D. 2-8, A. 2-5—21 scales along the sides in 8 or 9 rows; greenish above, reddish silvery beneath; large black spot on the tail, on the lateral line, over the end of the anal fin; fins tinged with rosy yellow; tail with a fine light red spot at the tip, ended with black. Length about 4 to 5 inches.

The fish described by Valenciennes was from Alipey. I have procured specimens in the river running past Canote in Malabar, which appear to be identical with those from Alipey. It frequents streams in small shoals, and is a very handsome fish. I have taken it with the fly, though not readily.

Systomus assimilis. (New Species.)

Very closely allied to the last, the same general proportions, number of scales, &c.; 1st, 2nd, 3rd and 4th soft rays of the dorsal prolonged, the 3rd the longest, the 4th the shortest, and the rest rapidly diminishing to the 7th; 2nd dorsal spine short, not more than half the length of the membrane; green above, reddish silvery beneath; black spot on the tail more diffuse than in the last. Cheeks golden orange; dorsal fin with the membrane yellow; 2nd dorsal spines red, other rays blueish. Caudal pale reddish yellow, with a bright red spot at each tip, and black at the base and sides. Pectoral rosy, ventral and anal transparent, tinged black at the base—D. 10, A. 7, &c. I procured this fish in a river in Canara. It appears to differ from *S. filamentosus* in the formation of the dorsal fin, colors, &c.

Systomus Maderaspatensis. (New Species.)

Also very closely allied. Differs in its colors chiefly, and in wanting (occasionally) the prolongation of the dorsal rays.

Dorsal fin reddish, stained with black; caudal edged broadly with fine red, and a black tip to each lobe; anal red; other fins reddish; I procured this fish from tanks near Madras; its usual length about 4 inches. I lately procured one specimen in the tank at Streepermatoor, not far from Madras, which had the dorsal rays prolonged, but which appeared to belong to this species. D. 3-8, A. 3-5, &c.

Genus *Abramis.*

Body short, elevated; a short dorsal; and long anal.

**Abramis Vigorsii.* (Sykes.)

I think it very probable that Sykes' *Rohtee Vigorsii* must belong to this genus. He describes it as D. 11, A. 28, body compressed; high in the middle, sloping to each end; head slightly recurved, eyes very large, 6 to 8 inches long. From the Beema river.

* *Abramis Ogilbii.* (Sykes.)

" A *Rohtee* with 12 rays in the dorsal, 17 in the anal fins; body very compressed, and very high, with the back sloping to each end from the centre; head sharpish; pectoral fins narrow, accuminated; 1st complete dorsal ray a strong bone, serrated behind. 4½ inches long, height 1½. From the Beema river." This, if it be a true

bream, is certainly not a typical one, and may perhaps be a *Perilampus* of McLelland.

Gen. *Leuciscus*.

Dorsal and anal small, without spinous rays ; head horizontal ; mouth moderate.

Leuciscus Malabaricus. New Species.

Head one-fourth of the length ; height much the same ; body somewhat cylindric ; dorsal medial—D. 10, A. 7—green above, silvery beneath ; a leaden blue stripe from the eye to the tail, with a yellow line above it ; length 3½ inches. 32 scales along the sides in 6 or 7 rows.

This fish is one of a small group in Southern India which appears allied in form and colouring to *C. mola*, and *C. daniconius* of Buchanan, though these species have smaller scales. My fish abounds in Malabar, in all the rivers and small streams, and even in ditches and tanks ; takes both fly and worm greedily ; it does not exceed 4 inches in length.

I have reason to believe that a distinct species exists in the Canarese streams, having a shorter body and larger head than the Malabar one ; and also another in the streams that run into the Cavery, characterized by its smaller head, and lengthened body ; but not having authentic specimens from the different localities at hand, I shall not at present attempt to characterize them.

Leuciscus Caverii. New Species.

Head about one-fourth length of body ; height one-fifth of length ; eye nearly one-fifth of length of head ; dorsal placed a little behind the middle of back, nearly opposite the anal ; 30 scales along the sides in 7 rows—D. 9, A. 6—green above, silvery beneath ; cheeks golden ; a blue stripe from opercule to tail, with a narrow yellow one above it ; lateral line concave—usually about 3 inches long.

Very common in the Cavery and all its branches. Called *Neddooba* by the Seringapatam fishermen.

Leuciscus flavus. New Species.

Head equal to the height of the body, one-fourth of the total length ; eye rather large, about 3½ times in the head ; dorsal medial ; scales about 30, very caducous, greenish yellow above, silvery

beneath ; a yellow streak along the sides, fins yellowish ; caudal tipped with black ; lateral line straight—D. 9, A. 6.

From tanks in the Carnatic, about 3 inches long.

Leuciscus xanthogramme.

Head rather smaller than the last, being about 4¼ times in the length of body; height 4½ times in the length; dorsal a very little behind the middle of the body ; lateral line curved; about 30 scales along the sides in 11 or 12 rows—D. 8, A. 6—lower lobe of caudal longer than the upper one ; eye rather small, about 5 times in head ; green above, silvery beneath ; a yellow stripe on the side from opercule to tail.

From tanks and rivers in Mysore and the Carnatic 3 to 4 inches long.

I possess a sketch of another *Leuciscus* from the Cavery of which I have lost my specimen, which appears to differ from any of these. It is nearly allied to *L. Caverii* in form, but has a much larger eye, and the depression in the crown more marked, muzzle in front of the depression continuing straight, parallel with the back ; profile of abdomen a good deal arched ; lateral line much curved. I am unable to give the number of fin rays or scales.

Leuciscus microcephalus. New Species.

Head small, one-fifth of length of body; eye close to muzzle ; opercule large, pointed ; profile of back rising from the crown, and gently arching to the dorsal, thence concave to the tail ; abdomen much curved to the anal, nearly straight thence ; height is 3½ times in the length ; dorsal fin behind the middle, over the interval of ventral and anal; 30 scales along the body in 7 rows, lateral line curved ; yellow green above, silvery beneath with a bright burnished silver streak along the sides, fins pale yellowish.

From tanks and rivers near Madras. Rare.

* *Leuciscus presbyter.* (Val.)

Head 4½ times in total length of body, height the same ; profile of back straight; that of abdomen slightly curved; dorsal fin advanced; anal small ; 26 scales along the body in 8 rows—D. 11, A. 7—back greenish, silvery beneath ; dorsal edged with blackish, 3½ inches long—from Bombay, allied to my *L. flavus*.

I am at a loss whereabout to place the following fish.

* *Leuciscus melettina.* (Val.)

Head equal to the depth, and one-fifth of total length of body; eye one-fourth of head; lower jaw with a small tubercle on its symphysis; 50 and more scales along its body; lateral line concave; cheeks burnished silver, which extends along the sides of the body in a line distinct from the silver of the abdomen—D. 11, A. 8, &c.—3½ inches long. From Bombay.

* *Leuciscus Mahecolæ.* (Val.)

Head shorter than the height of the body which is 4 times in total length; muzzle somewhat pointed, eye rather large, profile of back, and that of abdomen, similar and regular; scales large, 22 along the sides; lateral line slightly concave, on the 5th range, and two scales lower are observable, a series of small depressions, which are probably pores; greenish above, silvery beneath; dorsal reddish, pectoral and caudal greenish, the latter with a little black at the point of the lobes; ventral and anal colourless—D. 11, A. 7, &c.—3 inches long. From Mahi on the Malabar coast; appears allied in form to my *L. flavus*.

Leuciscus barbatus. New Species.

2 cirri on each side of its mouth, the posterior long, reaching to the ventral fin; head four times and two-thirds in its total length; profile nearly straight to the dorsal fin, which is placed well behind, slightly concave thence to tail; abdomen arching regularly to the anal; height is about 4 times in its length, lateral line near the abdomen and parallel with it; 32 scales along the body in 7 rows; dorsal fin small, not so long as anal; caudal fin large; green above, silvery beneath; a yellow stripe along the body—2½ to 3 inches long. Found in rivers and tanks all over Mysore and the Carnatic, rather common.

This fish very closely resembles the one described by Valenciennes as *Nuria thermoicos*, but appears to differ in some particulars of form, color, and remarkably so in its habit, the latter being found in hot springs of the temperature of above 100° Fahr. Buchanan has also an allied species, his *C. dourna*. Valenciennes places his *Nuria* between his *genera Dangila* and *Kohita*; a most unfortunate position, and one which shows how little idea of natural affinities he possesses. Were it not for its cirri it would barely differ from some of the *Leucises* just described. McLelland places another very

nearly allied species in his genus *Perilampus*. It also inhabits hot-springs at Pooree of 112 Fahr. I prefer however keeping those with short anal fins in the genus *Leuciscus*, especially when combined with an elongated body.

My next fish belongs to a very distinct form from any of the *Leuciscs* previously mentioned. It is however closely allied to *L. dystomus*, and *L. branchiatus*, McL., which are considered by McLelland to be true *Leuciscs*.

Leuciscus rubripes. New Species.

2 cirri; head equal to the depth of body, and 4½ times in total length; eye about 3½ times in length of head; profile of back slightly convex; dorsal fin nearly medial; lateral line descending at first, then nearly parallel to the abdomen which is nearly straight; mouth very slightly oblique; green above, golden on the sides, silvery beneath; dorsal fin yellow, edged with black; pectoral yellow; ventral and anal white, tipped with vermilion; caudal pink in the centre, yellow externally; 45 scales along the body in 12 rows--6 inches long.

I procured a single specimen of this pretty fish in the Bhowany river near Matypolliam.

I shall now give such of Sykes' fishes as appear to me to belong to this genus.

* *Leuciscus morar.* Buch.

Dorsal a little behind the centre of the back; with 10 rays, and 12 in the anal, edge of the belly smooth. Length 4¾.

Leuciscus landkol. Sykes.

Body nearly cylindrical, head gibbous; D. 12, a little before the centre of the back; eyes with narrow whitish sides, 10 inches long.

In the Goreh river, at Kullumb.

Leuciscus chitul. Sykes.

D. 14, A. 8. Head rounded, body sub-cylindrical; reddish grey color; 5 inches long, height 1½ inches.

In the Inderanee river near Chakur.

Leuciscus jorah. (Sykes.)

A *chela* with straight back, convex belly, dorsal far behind; size of a large minnow; with 10 rays in the dorsal, and 8 in the anal

fin. About 4 inches long; height $\frac{8}{10}$ of an inch. In the Beema river.

* *Leuciscus alkootee.* (Sykes.)

An elongated silver white, slightly compressed, minute *chela*, with the dorsal fin of 8 rays, very far back; anal about 10 rays; with burnished silver gill covers, and black orbits; rarely more than an inch long, and not much thicker than a good sized crow quill.

Gen. *Rhodeus.* Agassiz.

Body somewhat broad, compressed; dorsal medial.

Rhodeus Indicus. New Species.

Muzzle pointed, head 4 times in the length of body; profile of back angular, rising to the dorsal, falling thence to the caudal; abdomen arched; height $3\frac{1}{2}$ times in length; lateral line curving downwards; continuing only for about one-third of the body, as in the European *R. amarus ;* about 50 scales along the sides in 16 rows, eye large, near the muzzle; green above, silvery beneath, a yellow streak along the sides, fins colourless; length about 3 inches, D. 2-7, A. 7.

I have found this curious species only in the Pàlghat river, in sandy bottom.

Rhodeus macrocephalus. New Species.

Nearly allied to the last; differs in its larger head, more fusiform body, gradually thinning from the pectoral fin backwards; head about $3\frac{1}{2}$ times in length of body; height the same; scales minute, lateral line interrupted, as in the last; eye large—D. 9, A. 7—green above, silvery beneath; length about 2 inches. Common in the Cavery and its tributaries, and in the Carnatic in tanks.

It is possible that this may be the *Leuciscus sulphureus* of Valenciennes which I have previously given as a *Systomus*, as he places it close to the *C. amarus*, but without giving the number of its scales, or any thing about the interrupted lateral line, and as he places near it another fish with large scales, it is impossible to be certain to what subdivision his fish belongs.

Gen. *Perilampus.* McLelland.

Body deep, compressed, dorsal behind, placed opposite a long anal; apices of jaws raised nearly to a line with the dorsum; ventral margin much arched.

Perilampus Malabaricus. New Species.

Head is nearly 5 times in total length; height of body is 3 times in the same; about 35 scales along the sides in 10 rows; lateral line parallel to the abdomen—D. 15, A. 17—green above, silvery beneath, sides blue with 2 or 3 longitudinal streaks, and several vertical streaks and spots of yellow; dorsal, anal and caudal, pink; the latter with the central rays blackish; pectoral and ventral fins colourless; length about 4 inches; common in all the streams of Malabar out of reach of the tides, taking both fly and bait readily. It is a very pretty fish, and appears closely allied to the *P. asteographus*, *P. perseus*, &c. of McLelland.

Perilampus Canarensis. New Species.

Very closely allied to the last, head larger, being about 4¼ times in length of body; height rather more than 2½ times in the same; D. 15, A. 20. Color similar, to the last, but with the vertical streaks of yellow less developed, and the horizontal ones more so; dorsal fin greenish, tipped orange; anal and caudal yellowish orange, the former with a greenish mark on the base of central rays; pectoral and ventral fins greenish; about 3 inches long.

Found in the streams of Canara.

Perilampus Mysoricus. New Species.

Head 4½ times in total length of body; height 3½ times; lateral line bending down rapidly from top of opercule till on a line with the base of the pectoral fin; thence parallel with the abdomen—D. 11, A. 15—green above, silvery beneath; yellow and blue stripes on the sides. Dorsal, anal, and caudal fins yellow, tipped with orange; the caudal with the central rays yellow; pectoral and ventral fins colourless; usual length about 2½ inches.

Found in the Cavery, and all its tributaries; most abundant, like the two last species, in the rapid mountain streams.

Perilampus macropodus. New Species.

Head small, recurved, 4½ times in total length of body; height 3¼ times in the same; profile of back rising gently to the dorsal, falling thence to the tail; abdomen regularly arched—D. 9, A. 21. Pectoral fin long; ventral fin with the 1st ray larger than pectoral; green above, silvery beneath, fins yellowish; 2 inches long. I have only seen this little fish from the Cavery near its source in Coorg.

* *Perilampus teekanee.* (Sykes.)

A small *chela* with nearly straight back, snout in continuation of line of back ; belly arched—D. 10, A. 14. Length $2\frac{1}{4}$ inches, height $\frac{3}{4}$. In the Beema river.

Gen. *Pelecus.* Agassiz.

Body much compressed, elongated, belly cutting ; dorsal opposite anal, which is longish ; gape wide.

McLelland has placed the fishes of this genus among his *Opsarii*, but they are very distinct in general habit, structure, and mode of coloration, and are I think worthy of forming a distinct genus, which Agassiz assigns to them.

Pelecus cultellus. (Val.)

Head $5\frac{1}{4}$ times in total length of body, equal to the height of the body; eye one-fifth of head ; profile slightly rising from the nape to the middle of the body, thence gently concave ; abdomen slightly curved ; lateral line very little bent, dorsal small, placed slightly in front of anal; pectoral large ; ventral and caudal small—D. 9, A. 17—above 100 scales along the sides ; greenish with a tinge of red above, silvery beneath ; fins yellowish ; 6 to 7 inches long.

Common in tanks and rivers in the Carnatic.

* *Pelecus clupeoides.* (Val.)

Head one-fifth of total length of body, equal to the height; eye rather large; dorsal with the 1st ray inserted, not far behind the middle of the back ; lateral line concave; 70 scales along the body. $4\frac{1}{2}$ inches long.—D. 9, A. 14—from Mysore.

I am not acquainted with this fish, unless the following be identified with it.

Pelecus affinis. New Species.

Head about $4\frac{3}{4}$ times in the total length of body ; height about $4\frac{1}{2}$ times in the same ; eye one-fourth of length of head ; profile of back slightly curved, similar to that of abdomen—D. 9, A. 15—scales small (apparently about 90 along the sides, but my specimens are nearly denuded) ; pectoral fin long, lateral line slightly concave ; coppery green color above, silvery beneath ; fins yellowish. Length about 5 to 6 inches. Found in tanks and rivers in Mysore and part of the Carna-

tic. Very similar in form and coloration to *P. cultellus*. It appears very similar to McLelland's *Opsarius leucurus*.

Pelecus flavipinnis. New Species.

Head $5\frac{1}{2}$ times in total length of body ; height about $4\frac{1}{2}$ times in the same ; eye nearly one-fourth of length of head ; profile of back rising very gently from the nape, nearly straight afterwards ; abdomen much arched ; lateral line descending rapidly to near the ventrals, thence parallel to the abdomen, rising again when close to the caudal ; hook on the apex of the lower jaw very prominent ; from 60 to 65 scales along the sides—D. 9, A. 17—greenish above, silvery beneath, dorsal, anal and caudal fins white, edged with orange yellow ; 6 to 8 inches long.

I have hitherto taken this fish in the Cavery only. It is very closely allied to Valenciennes' *Leuciscus novacula*, which however is from the north of India.

Pelecus diffusus. New Species?

Head $5\frac{1}{2}$ times in total length of body ; height the same ; eye large, barely one-third of length of head, profile of back perfectly straight, that of abdomen regularly arched ; lateral line descending at first, afterwards parallel to the abdomen, but more distant than in the last species ; about 50 scales along the sides, in 9 or 10 rows ; green above, silvery beneath, with a bright yellow line intervening ; dorsal, anal and caudal fins yellow, with black edging ; other fins pale yellowish, pectoral fin not quite so long as in last ; length 4 to 6 inches—D. 9, A. 17—found in the Cavery and all its tributaries, very abundant. Takes fly readily. Is somewhat allied to *Leuc. scapellus* of Valenciennes, and also to *Opsarius pholicephalus* of McLelland, but appears to differ from both.

**Pelecus acinaces*. (Val.)

Allied to *L. scapellus* ; height of body one-fifth of total length ; profile of back perfectly straight ; eye $2\frac{1}{2}$ times in the length of the head which is 4 times in total length ; scales very caducous—D. 9, A. 13—a silvery band separates the green of the back from the brilliant silver of the belly,—3 inches long. From Mysore.

This is very nearly allied apparently to the last, but appears to differ in its larger head, number of rays of anal fin, &c., and the number of its scales are not mentioned.

**Pelecus balookee.* (Sykes.)

A *chela* the size of a minnow ; back straight ; body elongated ; dorsal fin situated far back, and having 8 rays, 14 in the anal, &c. length 3 inches. Common in all the rivers. Similar to the last.

**Pelecus Oweni.* (Sykes.)

" A *chela* with straight back, elongated and vertically compressed body; dorsal fin situated far back, with 11 rays, and 19 in the anal fins, with minute scales, 5 to 7 inches long. In most of the rivers." Is this *P. cultellus*?

Gen. *Opsarius.* McLell.

Mouth widely cleft ; dorsal moderate, usually placed behind the middle; anal generally longer than the dorsal ; lower margin of body more arched than the upper ; usually marked with streaks or spots.

Opsarius bendelisis. (Buch.)

No cirri ; head is three times and two-thirds in the total length of body; height 3 times; dorsal D. 10, A. 16; color green above, silvery beneath with 10 to 12 vertical blue streaks on the sides of the body ; in old subjects the cheeks and abdomen become fine red ; dorsal fin blackish, with a border of crimson, edged with white; anal the same, P. and V. with a reddish tinge; caudal black with a white margin; 40 scales along the body in 10 rows; up to 6 inches long. Found in the Cavery and all its tributaries; most ăbundant towards their sources in rapid streams. Takes fly very readily. In small specimens the stripes are green, and the dorsal (and sometimes the anal) are without any red. It is the *aguskitti* of the Seringapatam fishermen.

**Opsarius gatensis.* (Val.)

Body compressed, rather broad, abdomen much arched, height one quarter of total length, head 4 times and $\frac{2}{3}$ in the same ; eye large, mouth much cleft ; dorsal not very much thrown back, anal long—D. 10, A. 17—38 scales along the sides ; lateral line bent ; dark above, silvery beneath ; sides traversed by 9 small vertical bands—3 inches long. From the streams of the western ghauts.

This fish is evidently an *opsarius*, and I cannot help thinking may be identical with *O. bendelisis*. The chief points of difference are the larger head of my species, 2 scales more along the side, and one ray

less in the anal. If distinct, it is probably from some of the streams of South Malabar, and I remember taking a fish in a stream at the foot of the Khoondah ghaut which appeared to be at first sight identical with *O. bendelisis*, and which circumstance surprised me not a little, as I had never seen that fish except in the tributaries of the Cavery : unfortunately my fish was destroyed by ants before I had thoroughly examined it.

Opsarius Malabaricus. New Species.

Head one-fourth of total length, height $3\frac{1}{2}$ times in length, profile of back similar to that of abdomen, gently arched ; lateral line not much bent, dorsal with 1st ray inserted exactly in the middle of the body—D. 14, A. 16—40 scales along the sides in 13 rows ; l. l. in the 9th. Dusky green above with crimson reflections, sides golden, with a row of 10 beautiful blue round spots ; silvery on the cheeks and beneath ; dorsal fin blackish, edged with bright orange, rays glittering small blue ; caudal blackish, edged with white ; anal as dorsal but with some white mixed with the orange ; pectoral and ventral nearly colourless, with blue rays, and sometimes tipped with orange ; 5 or 6 inches long, usually smaller.

This very beautiful fish is found in most of the streams that run from the western ghauts into North Malabar, not descending far from the base of the hills, and keeping chiefly to the streams. It takes fly very readily.

Opsarius Canarensis. New Species.

Head is about one-fourth of the total length, and the depth is two times and two-thirds in the same, eye large ; lateral line gently bent ; dorsal fin nearly medial ; 36 scales along the sides in 10 rows—D. 12, A. 14—green above with purple reflections, golden on sides and beneath, with a double row of green spots on the sides ; dorsal, anal, and caudal fins black at the base, white externally ; pectoral orange tipped ; ventral colourless—about 5 inches long. Found in all the streams that run from the ghauts into Canara. Takes the fly readily.

The two last *Opsarii*, and *O. bendelisis*, form a peculiar group marked, among other points, by the black stained fins. My next species differs much in form and habit.

Opsarius dualis. New Species.

Head $4\frac{1}{2}$ times in the length of body and height $3\frac{2}{3}$ in the same; eye small; profile of back barely arched to the dorsal; thence concave; that of abdomen regularly arching; dorsal fin behind the middle; 42 scales along the sides in 11 rows—D. 9, A. 10—green above, golden on the sides with transverse bars; silvery beneath; fins white, tipped with orange; all the scales with a small black spot on the middle—about 4 to 5 inches long. I have found this fish in tanks and the rivers at Coimbatoor, and also in the river at Palghat. This is one of the few fish which I have found in rivers running both to the east and west coast, and it occurs just in that part of the country where the two districts are most nearly connected without the intervention of hills, viz., in the gap of Coimbatoor. This is an interesting subject on which much speculation might be advanced, but it would be out of place here.

It is by no means a typical *Opsarius*, though its mode of coloration allies it to them, its mouth being much more horizontal; and it appears very closely allied to the *Leuciscus cocsa*, (Buch.) which however is said to have 4 cirri, and moreover is from the north of India.

I procured some small specimens, about $1\frac{1}{2}$ inches long, of what I imagine is the young of this species, in a river in the Salem district.

Gen. *Aplocheilus*. McLelland.

Head flattened at the top, broad obtuse; intermaxillaries fixed; mouth large oblique; teeth large; dorsal fin behind, small; anal fin large; ventrals small.

Aplocheilus vittatus. New Species.

Head large, opercula somewhat scaly; profile of back straight; dorsal with a black spot at base, another on the opercula; olive brown above, silvery beneath; a series of vertical indigo blue bands on the posterior half of the body, 7, 8 or 9 in number; dorsal, anal and caudal fins blue spotted, and red edged; pectoral and ventral fins colourless; a silver spot on the occiput—D. 8, A. 17—up to $2\frac{1}{2}$ inches long. Found in ditches, ponds and rivers in Malabar. This and the other species of the genus are insectivorous, keeping almost entirely to the very surface of the water, and darting with great rapidity on any insects that drop into the water.

Aplocheilus rubrostigma. New Species.

A silver spot on the occiput; body rather more compressed than in the last, not much less in depth towards the tail than in front, dorsal with a black spot at its base; it, the anal, and caudal fins, pale sulphur yellow, red spotted; body olive green above, yellowish on the sides, and silvery beneath, with a series of longitudinal lines of red dots along the sides—D. 7, A. 14—ventral with the first very elongated, small. Length barely 2 inches. Still more common and abundant than the last in the same localities.

Aplocheilus affinis. New Species.

Very similar to the last; differs in the dorsal and caudal being nearly colourless unspotted, and the anal being unspotted orange, and having 16 rays instead of 14, being at the same time of less extent, body also not spotted. About 1½ inch in length. Found in the same localities as the last.

Aplocheilus Carnaticus. New Species.

Abdomen more arched than in the three last species; body much narrowed behind; dorsal small, anal long; head small; yellowish green above, silvery on the sides and beneath; caudal edged with orange; dorsal and anal pale yellowish, with dark edges. Ventral minute—D. 8, A. 22—1½ inch long. I procured specimens of this minute fish in the river that passes by Waniambaddy in the Carnatic. It is very nearly allied in form, number of fin rays, &c. to *A. melastigma* McL., but that is said not to exceed an inch in length, and, being from Calcutta, is probably distinct.

Gen. *Cobitis.*

Body elongated, cylindrical, head conical, with a thick fleshy covering; snout fleshy with small cirri; mouth small; caudal entire, or slightly lobed.

Cobitis Carnaticus. New Species.

Caudal with small pointed lobes; head depressed, equal to the depth, and 5½ times in total length; 6 longish cirri; dorsal rather in front of the middle; body olive green above, with dark blotches; dorsal and caudal spotted, the former yellowish, the latter reddish—D. 9, A. 6.

Found in sandy rivers in the Carnatic up to 3 inches in length.

Cobitis Mysorensis. New Species.

Muzzle rounded, head less depressed ; 6 short cirri ; greenish above with a few irregular dark spots—D. 8, A. 6—caudal nearly square, barred, with a black spot at its base above. About 3 inches long. Found in the tanks and rivers throughout Mysore.

Cobitis rubripinnis. New Species.

Dorsal with 2 rows of spots, the lower ones red ; caudal unspotted ; of a reddish yellow colour, with olive green back, descending in pointed bars to middle of body—D. 9, A. 6—a black stripe on tail just before the caudal fin. Found in sluggish streams in Malabar. Caudal fin nearly square.

Cobitis montanus. New Species.

Head short muzzle raised rounded ; dorsal long, with two rows of black spots, a streak of black at insertion of caudal ; body reddish pink with 6 large greenish bands descending to the belly ; caudal with two rounded lobes ; about 2½ inches long. Found in a small stream in Coorg.

I believe that several other species of Loach exist in the South of India, but I have not materials at present for their description.

Colonel Sykes has several which I shall here give.

Cobitis Rüppellii. Sykes.

Nearly cylindrical, 2 to 3 inches long ; lateral line marked with short brown bars, and rays of dorsal and anal fins similarly barred ; D. 13.

From the Beema and Mota Mola rivers.

**Cobitis mooreh.* Sykes.

Smaller than the last, head more obtusely pointed ; bars differently arranged—D. 12, A. 7.

**Cobitis maya.* Sykes.

"Differs from the first in having a spine under each eye, and in having a blunter head—D. 9. &c."

My species appear to belong to McLelland's subgenus *Schistusa* which has the caudal lobed.

Gen. *Platycara.* McLelland.

Head flat with the eyes above; ventral fins large, rounded; body not compressed; caudal bifid, mouth beneath, (with short cirri,) small, without teeth.

Platycara Australis. New Species.

Muzzle depressed, snout somewhat pointed; eyes approximated; body greenish with irregular spots and blotches of brown and red, and a series of white spots along the sides; fins greenish, tinged with sienna red and spotted; caudal with the lobes pointed, lower one much the longest; 4 minute cirri at end of snout, and 2 somewhat fleshy short cirri, one in front of and the other behind the mouth. Length about 2½ inches—D. 7, A. 6.

I procured a single specimen of this interesting addition to Indian Ichthyology in the small mountain stream that passes close by the bungalow in the Walliar jungle.

This concludes the numerous family of carps. Some of my supposed new species of *Aplocheilus* and *Cobitis* may have been described by Valenciennes in the 18th volume of the great work on Fish by Cuvier and Valenciennes which I have not myself yet seen.

Fam. *Siluridæ.*

No true scales; body sometimes mailed; strong spines frequently on the dorsal and pectoral fins; 2nd dorsal (often) adipose.

Gen. *Silurus.*

One dorsal fin, small, advanced, not spiny; anal fin very long; cirri usually long; teeth fine, crowded.

Silurus ruallagoo.

Head about 5 times in total length; eye one-seventh of length of head, and with 5 diameters between them; muzzle depressed, parabolic; maxillary cirri reach nearly to the anal fin; lower cirri minute—D. 5, A. 92, to 93—caudal lobed deeply; the upper the lowest; of a leaden color throughout, darkest above; dorsal and caudal fins greenish dusky; pectoral, ventral and anal reddish yellow, the latter edged with dusky; up to 3 feet and upwards.

Found in the rivers and tanks throughout all the south of India. It is the *télé* of the Tamools.

It is much esteemed by the Natives and is by no means a bad fish. It is very voracious, and is often taken with a fish or frog for a bait. It is a sluggish fish in its habits, and when taken does not afford much sport to the angler. It may be considered as the pike of Indian fishing. If it is identical, as Valenciennes asserts, with Buchanan's *S. voalis*, that name will have the preference.

Silurus Mysoricus. Val.

Head about 6 times in total length of body; eye about 5½ times in the length of head; height at the pectorals 5 times in its total length; caudal lobed, the lobes nearly of equal length, but the upper one the most rounded of the two; dorsal very narrow; pectoral spine moderate, smooth; maxillary cirrus reaches little beyond the pectoral; muzzle very obtuse—D. 4, A. 75.

Greenish above, iridescent on the sides and beneath; fins glossy. Length up to 12 or 14 inches.

Found in the Cavery and most of its tributaries; also in tanks throughout Mysore. It is most excellent eating. It is called *Godla* by the Canarese fishermen of Mysore.

Silurus Malabaricus. C. V.

Lower jaw much longer than the upper; pectoral spine of moderate strength, toothed—D. 4, A. 62-64—ending very near the caudal, which is deeply lobed; of a yellowish colour throughout, except on the abdomen which is white; fins edged with black; up to 12 or 14 inches long. I have only seen this *Silurus* from rivers in Malabar.

* *Silurus bimaculatus.* Bl., C. V.

Head equal to the depth at the vent, and 5½ times in the total length of the fish; breadth of head two-thirds of its length; maxillary cirrus nearly ½ the length of the body; inferior cirri short and slender; pectoral fin rounded—D. 4, A. 62-65—lateral line straight, 6 to 8 inches long.

The specimens whence Valenciennes' full description of this species is taken, were brought from Java. M. Valenciennes is inclined to identify it with the fish sent from Tranquebar and described under this name by Bloch. This is however, I think, very improbable, as so very few fresh water fish, common to the Peninsula and the isles, are at present known, and I should be inclined to imagine it either to

be *L. Malabaricus*, or an allied species peculiar to the Carnatic, if it was procured from that side of India.

**Silurus pabo.* Ham.? Sykes.

"Tail with two unequal lobes, both pointing downwards; 4 cirri shorter than the head, and 68 to 70 rays in the anal fin. Length 12-15 inches, height 2½ to 3. Found in most of the rivers, differs slightly from Hamiltonis *S. pabo.*"

**Silurus boalis.* Ham.? Sykes.

"Fin of the tail with two unequal lobes; with 4 cirri, of which 2 extend to the middle of the fish; all the fins unarmed—D. 5, P. 15, V. 9, A. 84. Attains the length of 3 feet and the weight of 8 lbs. Found in the Mota Mola at Poona. Differs slightly from the *S. boalis* of Hamilton."

Gen. *Schillee.* Cuvier.

One dorsal fin, with the spine strong and toothed; body much compressed; anal fin rather long; teeth large.

Schillee Sykesii. New Species.

Head one-fifth of whole length of body; much compressed, its width being about half its length; eye large, being 3½ times in the head; maxillary cirri reach the ventral fin, all the other (6) cirri longer than the head; dorsal and pectoral spines serrated, the latter strongly so; anal fin about one-third of length of body—D. 1-6, A. 36—colour greenish above, silvery on the sides and beneath.

I obtained some small specimens about 6 inches long in the Cavery, and I do not know to what size the species attains.

There is hitherto but one species of *Schillee* recorded from India, viz., *S. Garua* of Buchanan, from which my species differs in many particulars, more especially in the compression of the head, larger eyes, serrated dorsal spine, &c. &c.

Gen. *Bagrus.*

2d dorsal fin adipose; a double row of intermaxillary teeth; cirri, and relative size of adipose and anal fins, variable.

A. with 8 *cirri.*

* Adipose short and anal fin long.

Bagrus atherinoides. Bloch.

Head 6½ times in total length; depth 4½ times in the same; maxillary cirri reach beyond the ventrals; the others all longer than the head; eye small; dorsal spine finely serrated; pectoral spine with 10 or 11 strong teeth—D. 1-5, A. 36—reddish yellow above; white abdomen, and a broad silver streak from head to the tail; dorsal, pectoral, and ventral fins colour of back; caudal and anal pale yellow, the former with a black spot at its base—length about 4 inches.

I have obtained this pretty little fish from tanks in the neighbourhood of Madras. It does not appear to have been sent home by the French collectors.

**Bagrus goonguaree.* (Sykes.)

"An *Hypophthalmus* with 8 cirri, all longer than the head, but not extending to the middle of the fish; with 7 rays on the dorsal, and 52 in the anal fin; with an extremely minute second dorsal; first ray in the pectoral, and first in the dorsal, spinose, and serrated behind; greatest length 28 inches, body vertically compressed. Found in the Mota Mola near Poona."

I have not seen this fish which appears nearly allied to *Bagrus vacha* of Buch.

Bagrus taakree. (Sykes.)

" An *Hypophthalmus* with 8 cirri, 2 of which reach to the ventral fins, 2 very minute near the nostrils, and 4 in the chin, nearly as long as the head; with the first dorsal and pectoral rays serrated on the posterior edge, with 8 rays in the dorsal and 50 in the anal fin; length 9 inches, height 2 inches.

* * Adipose fin long, anal fin short.

Bagrus aorides. New Species.

Head is 3½ times in the body, flat, depressed, narrow, its width being 3½ times in its length, eye 4¼ times in the length of head, so situated that its posterior edge is more than half the length of the head from the muzzle; not quite one diameter between the two eyes; maxillary cirri long, reaching to the tail; posterior, lower cirri equal to the head; 2d dorsal spine with very fine serræ posteriorly, and 2 or 3 in front; pectoral spine strongly serrated posteriorly; adipose fin reaching from rear the 1st dorsal to beyond the posterior edge of the anal—D 2-7, A. 12—length about 1 foot. Colour greenish, iridescent

above, silvery iridescent beneath ; upper fins greenish, with a black spot on the posterior edge of the adipose fin (as in B. aor.); lower fins glossy.

I procured some specimens of this remarkable looking fish in the Cavery river at Errode. It is nearly allied to *B. aor.*; whence my name, but differs both from it and one or two allied species.

**Bagrus seenghala.* (Sykes.)

" A *Platystoma* with the tail fin crescent shaped, lobes unequal; with 8 cirri, 2 of which only are longer than the head, reaching to two-thirds of the length of the fish ; the first ray of the pectoral fins serrated behind ; head long, flat, spatulate, covered with a granulated long plate. Dorsal fin of 8 rays ; high ; ventral fins far back, of 6 rays. Grows to a great size ; flesh heating and soft." I have very little doubt that this fish of Sykes is also closely allied to *B. aor.*, no Indian *Platystoma* being known at present.

Bagrus Cavasius. (Ham. Buch.) C. V.

Head about one-fourth of length of body, dorsal spine one-third shorter than next soft ray, without teeth ; pectoral spine strongly toothed, adipose fin reaching from the dorsal close to the caudal ; upper lobe of caudal somewhat longer than the lower ; maxillary cirri as long as body—D. 1-7, A. 11—from 4 to 6 inches long ; light plumbeous above ; whitish or yellowish beneath ; fins leaden; about 6 inches long. This fish is spread throughout all India from the north of Bengal to the south of the Carnatic, being found in rivers and tanks. I have not however as yet procured it from Malabar.

Bagrus keletius. C. V.

Nearly allied to the last; differs in the point of its occipital crest being longer and not so sharp, in its 1st dorsal fin being rounder, the trunk of the tail being higher ; and its maxillary cirri only reaching to the middle of the anal—D. 1-7, A. 1-12, &c. I have procured this fish from Mysore.

Bagrus montanus. New Species.

Head about 4 times and one-eighth in the length of body ; height 5 times in the same; eye about 4 times in the length of head and with $1\frac{1}{2}$ diameter, between them ; maxillary cirrus reaches to the anal fin; 2nd dorsal about one fourth of total length; dorsal spine very slightly

toothed; pectoral spine with 7 or 8 strongish teeth on its terminal half; occipital spine very short, almost linear. Colour greenish above and on the fins; yellow on the cheeks and beneath; length about 6 inches.

I have only found it in the river at Manantoddy in Wynaad.

Bagrus Malabaricus. New Species.

Very closely allied to the last; differs in its head being slightly shorter, being nearly 4½ times in the length of body, height much the same; pectoral spine with 15 teeth, maxillary cirri reach beyond the ventrals only—D. 1-7, A. 11—colours blueish leaden above, silvery beneath; fins yellowish. Habitat. Mountain streams in Malabar.

Bagrus vittatus. (Bloch.) C. V.

Head about 4 times in the length of body; height not quite so much; eye 4½ times in the head, and with two diameters between them, occipital spine moderate, approaching to the dorsal, dorsal spine with 2 or 3 fine teeth in front and 7 or 8 very fine ones behind; pectoral spine, strong, flat with about 13 strong teeth; maxillary cirri reach to end of ventrals; adipose fin about ¼ of total length—D. 1-7, A. 10—colour coppery brown above, yellowish beneath, with two longitudinal whitish stripes on the sides of the body. Length about 4 inches.

I have only found this *Bagrus* in the neighbourhood of Madras where it is tolerably common. I think that it is most probably the species so named by Bloch, who received it from Tranquebar.

Bagrus affinis. New Species.

Very nearly allied to the last; differs in its more depressed head; eye if any thing, smaller; occipital spine more triangular; dorsal spine barely toothed; pectoral spine less strongly toothed, and only 12 teeth; broader; head, about 3½ times in the body; maxillary cirri reach to the ventrals; colour pale blueish above, yellowish on the sides, whitish beneath; fins yellowish—D. 1-7, A. 9—length about 4 inches. I procured this fish from the neighbourhood of Madras. It may perhaps be Bloch's *vittatus*.

* * * With short adipose, and short anal fins.

Bagrus albilabris. C. V.

Head 4½ times in length of body; height 5 times in the same; eye one-sixth of length of head, and 3 diameters distance between the two; dorsal spine moderately strong, short, toothed; first and se-

cond soft rays much longer, pectoral spine strongly toothed; adipose fin opposite the anal—D. 1-7, A. 14—maxillary cirri reach somewhat beyond the ventrals; olive brown above; yellowish beneath; lower fins tinged red—length about 5 inches.

I have procured this fish at Madras from the rivers and backwaters, living both in fresh and brackish waters. I do not think that Valenciennes' *B. fuscus* differs specifically from this. It is common in the rivers and backwaters of Malabar.

Bagrus punctatus. New Species.

Head one-fourth of body; height 4½ times in the same; eye 7 times in the length of head, and with 4 diameters between the two eyes; occipital spine ends in a narrow line; dorsal spine, weak, not toothed; pectoral spine serrated, of no great strength; maxillary cirri reach to end of ventrals, other cirri all shorter than head; adipose fin nearly two-thirds of length of 1st dorsal—D. 1-7, A. 12—colours pale olive above, yellowish on the sides, and white beneath; a row of black spots along the sides; lower fins yellow. Length up to 18 inches and more.

This fish, which is considered good eating, is found in the Cavery and its principal tributaries, not descending however to any great distance.

Bagrus oculatus. C. V.

Eye one-third of length of head, and with only one diameter between the two, maxillary cirri beyond anal, adipose fin about equal in length to the anal; green above, whitish beneath, fins edged with black; 3 inches long—D. 1-7, A. 12.

I have only procured this *Bagrus* in the river that runs near Palghat in South Malabar.

Bagrus agricolus. New Species.

Head 4 times in length of body; eye 4 times in head and with two diameters between the two; dorsal spine short, very finely toothed; pectoral spine strong with large teeth—D. 2-7, A. 10—maxillary cirri reach the ventrals. Length 2 inches; colour greenish leaden above, whitish beneath.

I found this small *Bagrus* in ditches and inundated paddy fields in the Wynaad.

B. with 6 cirri.

Bagrus ? kuturnee. (Sykes.)

" A *Phractocephalus* with 6 cirri, 2 of which only are longer than the head ; the first pectoral spine serrated on both edges ; the 1st dorsal spine on the posterior edge only ; these two spines ending in a filament ; the shoulder bone elongated into a point behind ; greatest length 6 inches ; dorsal fin of 7 rays, pectoral of 9 ; ventral fin small, of 7 rays ; second dorsal replaced by a small adipose fin."

I have placed this fish, described by Col. Sykes as a *Phractocephalus*, among the *Bagri*, but with great doubt, as I do not find any *Bagri* with 6 cirri to be true fresh water fishes.

Gen. *Pangasia.*

4 short cirri ; 10 branchial rays ; anal fin rather long ; adipose small ; head depressed.

* *Pangasia ? gogra.* (Sykes.)

"A *Phractocephalus* with 4 shortish cirri, the plates of the shoulder elongated into acute, angular, broad spines, with a dorsal fin of 8 rays, first ray a bone, serrated behind ; pectoral fin of 10 rays, the first ray a broad compressed bone, serrated on both edges ; head flat and broad ; second dorsal small fleshy, size 6 inches, but grows larger."

I have placed this fish of Col. Sykes' list as a *Pangasia* with the characters of which it appears to correspond better than those of any other Indian Genus.

Gen. *Silundia.* Val.

Head small, smooth ; adipose very small ; anal fin long ; 2 very minute cirri.

* *Silundia Childreni.* (Sykes.)

" An *Ageneiusus* without cirri, with the first ray of the dorsal and pectoral fins serrated on the anterior edge only, with 8 rays on the dorsal and 42 in the anal fin ; with two sharp lobes to the tail, the upper being somewhat the smallest. Length of fish 18 inches ; height 4½ inches, but grows to a larger size. Second dorsal adipose, minute."

I have very little doubt that this is a true *Silundia*, and perhaps the *S. Gangetica*, though Sykes says there are no cirri, for it appears

that the 2 small cirri which are present in that fish are made out sometimes with difficulty.

Gen. *Pimelodus*.

Palate without teeth; maxillary cirri (often) thick, fleshy; otherwise similar to Bagrus; frequently marbled or blotched.

* *Pimelodus Yarrelli*. (Sykes.)

" A *Bagrus* with the first rays of the pectoral and dorsal fins terminating in long fleshy tendrils and serrated behind; with 8 cirri, two of which are as long as the head, thick, fleshy, and being lateral elongations of the upper lip; other cirri very short, head broad, covered with a granulated bony plate; the fish olive brown, marked with black blotches like a Dalmatian dog; 2d dorsal fleshy, triangular. Length 18 inches, but attains a very great size; body not vertically compressed. Found in the Mota Mola at Poona."

Seems nearly allied to *P. bargarius* of Bengal.

Pimelodus lonah. (Sykes.)

" A *Bagrus* with 8 small cirri, flat, granulated head; first dorsal of 7 rays, and pectoral of 10 rays, the first ray of which is furnished on the posterior edge with long sharp teeth; anal fin of 10 rays; 2d dorsal of a triangular form, fleshy; something resembling the preceding in colour."

Pimelodus itchkeea. (Sykes.)

"A *Phractocephalus* with 8 cirri, 2 of which from the upper lip extend to the end of the pectoral fins; the other 2 very minute, with the 4 on the chin nearly as long as the head; with the 1st ray in the pectoral fins only serrated; with 8 rays in the dorsal and 12 in the anal fins; with a sharp prolongation of the scapula. Fish handsomely marked on the back with dark colours; length 2 inches."

Pimelodus Carnaticus. New Species.

Head broad, muzzle blunt, eye small, situated far back; dorsal spine smooth; pectoral spine strongly toothed; maxillary cirri barely as long as the head, all the others short, slender—D. 1-6, A 12—colour yellow ochre, blotched and marbled with brown about 4 to 5 inches long.

I have only found this curious fish in the Bowany river. It is said not to exceed 6 inches or so in length.

Gen. *Clarias.*

Dorsal fin single, very long ; caudal fin rounded ; eyes small ; anal fin long.

Clarias marpus. C. V. *Marpoo.*

Russell, 168.

Head one-sixth of total length ; sides of head but slightly arched ; casque very rough ; maxillary cirri reach to the end of the pectorals—D. 68, A. 48—up to 1 foot long. Colour purplish black or brown, paler beneath. Found in rivers and tanks throughout the country. It is called *yerri valé* in Tamool, and is said to be good eating.

* *Clarias magur.* Buch. Ham.

Sides of the head more convex than in the last, giving it a broader head ; casque smooth ; pectoral spine almost smooth—D. 70, A. 52—up to 12 inches.

Said to have been brought from Malabar as well as from Bengal where it is very common.

Clarias Dussumerii. C. V.

Head as in the last, pectoral spine distinctly toothed ; blackish green above, grey beneath ; 7 to 8 inches long—D. 69, A. 50. Found in tanks and ditches in Malabar.

* *Clarias batrachus.* Bloch.

Maxillary cirri reach the ventrals, and lower cirri the pectorals ; covered with white spots—D. 67, A. 45—said to have been brought from Tranquebar, where it is called *tali.* It is most probably *C. marpus*, badly delineated.

Gen. *Saccobranchus.* Cuv.

A single small dorsal ; anal fin very long ; all the cirri moderately long ; eye minute ; tail rounded, distinct from the anal.

Saccobranchus fossilis. (Bloch.)

S. singio. Buch., Cuv.

Very deep chesnut colour, almost black—D. 6, A. 74—up to 1 foot long. Found in tanks and ditches all over the South of India.

I possess a drawing of a species of *Plotosus* of a dark chesnut or maroon colour throughout, which, I was told, at the time, was a fresh

water fish, but I have not had an opportunity again of verifying this. It is however quite possible, as Bengal possesses one or two fresh water *Plotosi.*

Fam. *Clupeidæ.*

Dorsal fin single, central; mouth small oblique; teeth minute; body compressed, aperture of gills large; scales large deciduous.

Gen. *Notopterus.* Lacep.

Ventral fins minute; dorsal fins small, nearly central; anal very long, united to the caudal.

Notopterus kapirat. Lac.

I have only observed one species of this genus in South India which I presume to be the one named as above, but as I have no access to any description of the species shall not attempt to characterize it.

Colonel Sykes has one species of this genus which he has named *Mystus badgee*—D. 8, A. 105—length 11 inches, height 3; all his other characters are generic, so that it must remain at present uncertain if his species be identical, or not, with the one of S. India.

Gen. *Butirinus.* Commerson.

Body lanceolate, not much compressed; belly rounded, smooth; dorsal and anal fins both short; ventral under the dorsal; jaws and tongue armed with numerous fine teeth; those in the palate blunt.

Butirinus argenteus. Forster, Bloch.

Head about 4½ times in the whole length of body; eye near the muzzle; and elongated scale at the base of the dorsal (on each side), pectoral and anal fins; and 2 at the base of the caudal; green above, white beneath, the whole fish silvery; fins glossy; up to 3 feet long, about 82 scales along the sides in 22 rows—D. 14, A. 8.

I have hitherto only seen this very handsome fish in a fresh water tank at Coondapoor in North Canara. They abound here, and are supposed to have been introduced by Hyder Ali.

At present they are protected by the officers of government from being caught by any one, but a stranger passing through the place is permitted, on his requisition to the authorities, to have a fish hunting, which takes place in this wise. A line of boats is formed at one end of the tank (which may be about 250 yards long by 150 broad) and a long deep net is carried along the line of boats pulled at either end

by a few men on shore. This net is gradually pulled towards the spectator, the line of boats advancing slowly along, and now and then a fine fish is seen jumping out of the water—when half the tank is drawn and the fish consequently are accumulated towards the hither end of the tank, they begin to attempt to force the line; many succeed by jumping over the net, held as high as the fishermen's hands can reach; some come plump upon the fishermen and knock them over, making their escape thus; and others are caught by the net and fall into the boats where they are quickly despatched. It is indeed a most curious sight; 40 or 50 fish, many of them of large size, being often seen in the air at once. It is not uncommon for 50 or 60 fish from $1\frac{1}{2}$ to 3 feet long to be taken at one haul. The flesh, to the taste of a European, is rank and disagreeable, but the natives esteem it most highly as a restorative and aphrodisiac. It is called *Poo meen* by the natives.

Butirinus Maderaspatensis. New Species.

Palap Contah, Russell 207.

Head one-fourth of whole body; no elongated scales at base of dorsal, anal or caudal fins; 75 scales along the sides in 21 rows; body deeper than in the last; green above, white beneath, silvery throughout, fins tinged with yellowish—D. 14, A. 8, &c.

I possess some small specimens of this fish which appears to differ from the west coast one described above. It was procured at Madras from tanks, I was informed, but I believe it is chiefly an estuary fish. It is called *moram kendé* at Madras.

Gen. *Megalops.* Lac.

Mouth very oblique; body moderately compressed; eye very large; dorsal and anal fins falcate.

Megalops filamentosus.

Kundinga. Russell, 203.

Head $3\frac{2}{3}$ in length of body; eye 3 times in the head; last ray of the dorsal prolonged to a filament; 40 scales along the lateral line in 11 or 12 rows—D. 19, A. 25—up to 2 feet and upwards.

This is chiefly an estuary fish, but it is to be found in many tanks of fresh water on the Malabar Coast; introduced, I suppose.

I have taken it with fly, from a small stone built tank at Mahé, upwards of two pounds weight.

Gen. *Alosa.* Cuv.

Mouth moderately large, upper lip notched; dorsal medial; anal moderately long.

Alosa palasah. Cuv. Probably the same as *Clupanodon ilisha,* Buch., and *Clupea Indica* of Gray, Hardwickes' Ill. Ind. Zool.

Palasah. Russell, 198.

I have every reason to believe that this is the so called sable fish of Trichinopoly, which ascends the Cavery during the freshes for the purpose of spawning, and is caught for the sake of its roe, which is highly esteemed.

It is called *Oolan-min* at Madras.

Another small clupeoid fish is sometimes taken in ponds and ditches in Malabar during the monsoon. It is closely allied to the *Clupanodon chachunda* of Buch. Hamilton.

I have no specimen at present to describe it from.

Fam. *Esocidæ.*

Dorsal fin single, near the tail; mouth large; teeth numerous, large, acute.

Gen. *Belone.*

Body linear sub-cylindrical; jaws excessively long, pointed, with acute teeth; scales minute.

Belone Graii. Sykes.

Tail nearly square; head is two and a half times in the body; dorsal fin about 6 times in the length—D. 16, A. 17—Pale green above, with a tinge of fine red on the back, silvery beneath, caudal reddish —length up to 14 inches.

This fish is found in most of the rivers of the west coast up to the base of the mountains. It is very voracious, and devours large quantities of the little *Aplocheili.* I cannot be certain if it is Sykes' species or not. He says of his, " D. 16, A. 16—closely allied to *E. cancila* of Buchanan, Hamilton."

Ord. Apodes.

Fam. *Murænidæ.*

Body serpent like; scales very minute, enveloped in a mucous skin; no ventral; branchial spiracles two, lateral.

Gen. *Anguilla.* L.

Dorsal, anal and caudal fins united into one; pectorals oval; spiracles placed just beneath the base of the pectoral.

A. bicolor. McLelland?

Chemloo pamoo, Russell, pl. 31.

I have not a specimen of the common eel of the south of India by me at present, to compare with McLelland's description of his fish which was from Arracan. He suggests that it may be the same as Russell's species, but I should think this very doubtful. Our eel is not a very common, nor abundant fish, being found chiefly in large tanks, and deep holes in the larger rivers. It is of a dark olive colour above, yellowish beneath, length up to 4 feet. It is very good eating. It is taken in nets, or by a night line.

I add McLelland's description of his Malay fish, so that any one who has the opportunity may compare our fish with it. "The dorsal occupies rather more than half the entire length, and commences exactly over the anus. The jaws are depressed, the upper rather shorter, and narrower than the lower jaw. The breadth of the head about equal to that of the body. The distance from the base of the pectorals to the end of the nose, equal to one-third of the interval from the nose to the commencement of the caudal. The teeth are fine, like the pile of velvet, consisting of a broad band on either side of the jaws, and another on the lower. The fin rays are,

P. 18, D. 245, A. 221.

The colour above is dark olive green or brown, and white below. One of the specimens examined was about 2 feet in length.

* *Anguilla Elphinstonei.* Sykes.

" An *anguilla,* with the lower jaw the longest; with the back, tail and anal fins united, and with a broadish, flat head; body dark green, blotched with black; with 2 short tubular processes, one on each side of the upper jaw. Attains the length of 3 feet, and diameter of 3 inches."

This description is insufficient to distinguish it very exactly from other allied species.

III.—*Remarks on the Word Tersai.* *By* Mr. Samuel Marcar.

[We have much pleasure in giving insertion to the following philogical observations of a young Armenian friend who has diligently devoted himself to the study of his national history and literature; both on account of its general interest in connection with the ancient people to which it refers, and of its particular bearing on the Syrian Sasanams which were so ably expounded by Dr. Gundert in our 14th vol.]

In the thirty-second number of the *Madras Journal of Literature and Science*, an extract is inserted at page 199 from the letter of the Rev. Dr. Gundert, respecting the name *Tarsa*, which is said to signify a "Christian" in the Persian language. This word occurs likewise in the forms of Tersai and Terzai in several productions of early times. Various explanations have been offered by learned writers regarding the origin and signification of that epithet: the subject on the whole leads to interesting historical and philological inquiries. I trust, therefore, I shall be excused, if I produce in this place, some passages out of those authors, in reference to the present purpose, accompanying them with a few cursory remarks of my own, by way of illustration.

In a book printed at Rome in 1618 under the title of "De Christiana Expeditione apud Sinas"—a compilation from the Memoirs or Commentaries of Father Matthæus Ricci, a Jesuit, who visited China about the year 1600—the word Terzai is found as an appellation given to Christians. The editor of that work, one Nicholaus Trigautius, or Trigault, a Dutchman, in speaking of the religion of the Chinese and of the introduction of Christianity among them, has the following curious particulars. "Saraceni porrò Crucis adoratores præter vulgare gentis vocabulum, quo Christianos omnes *Isai*, id est, Jesuinos vocant, etiam in hoc regno antiquos illos Crucis professores *Terzai* appellant, cujus appellationis causam nescio, nisi quod ex Armenio quodam audivi, Armenios Christianos in Perside eodem nomine nuncupari. Unde fortasse conjicere licet hos Crucis veneratores ex Armenia originem traxisse, et ab occasu variis fortasse temporibus, et eo maxime quum Tartari magnis exercitibus in Sinarum regnum irrupissent, penetrasse, quo etiam tempore Marcum Paulum Venetum constat huc pervenisse." A distinguished oriental scholar of Germany, Andreas Muller, in an ingenious Disquisition "De Chataja," appended to his edition of Marco Polo and Haithon, Berlin, 1671, has investigated the source of the appellative Tersai, with great erudition and research. He ascribes, with Trigautius, the employment of that term to Armenian medium, and adduces sundry

proofs in corroboration of his sentiments. The subjoined extract from the above mentioned Essay (p. 89,) relates to the word under consideration. "Longè plures verò et passim in *Tartaria* vicinisque regionibus reperti sunt Christiani. *Armenorum* etiam studium, quod *conversioni Tartaros* impenderint, imprimis commendatur. Christiani etiam, qui ibi locorum degebant, Armenorum propagines fuisse videntur. Communiter enim *Crucis adoratores* vocabantur, et Rex gentis, quem Presbyterum Johannem vulgò vocant, (Arabice) *Prestar Chan*, hoc est, *Adoratorum Imperator.* Armeni vero ab olim *Chazinzanii* dicti sunt, hoc est, σταυρολατραι. *Vide not. meas ad Aziz. num.* 24 et ad *Ep. Mosis Mardeni p.* 17. Certum est Christianos illos *crucem* imprimis (neglectis Imaginibus aliis, *Cadamustus, c.* 133) veneratos esse. a—Tonsura Catholici Armeni in formam crucis est. *Cadam. l. c.* b—Insigne labari Najamici crux erat. *Marc. Paul. Ven.* II. 4. c.—Solebant etiam *Staurolatræ* in *Sinis* crucem digito signare cibum potumque usurpaturi. *Trig. è Riccii ore.* Hi verò in Sinis *Tersai* à Saracenis vocabantur. *Trig.* Eodem nomine, quo Christiani Armeni in Perside appellabantur, Armeno quodam, quem Trigautius laudat, teste. Indeque Trigautius colligit *Crucis adoratores ex Armenia esse, cumque Tartaris in Sinas irrupisse.* Qui cum causam appellationis nescire se fateatur. *Videsis not ad Azizum. num.* 14." I am sorry that I do not possess the work of Muller referred to at the end of the foregoing citation. A different construction of the subject, however, is adopted by the learned Syro-Maronite, Joseph Simon Assemanus. In the fourth volume of his laborious compilation, the "Bibliotheca Orientalis Clementino-Vaticana," he has examined the question in a detailed form. After a lengthy analysis of the authorities, he comes to the conclusion, against Trigautius, that the origin of Tersai is either Persian or Arabic, not Armenian, and that the term was applied to Syrian-Nestorians, not to Armenians. These are his words:—"Christianos in Sinarum regno Syros Nestorianos fuisse, non Armenios, neque ex Armenia, sed partim ex Assyria et Mesopotamia, partim ex Sogdiana, Bactriana et India illuc convolasse, eo maxime tempore, quo Tartari in illud regnum invaserunt." (p. 519.) Not to multiply instances;—a modern scholar, the Rev. Samuel Lee, Arabic Professor at Cambridge, makes an allusion to this affair in a note to his translation of the "Travels" of Ibn Batuta. He draws his materials from Assemanus, and proceeds to observe (p. 217) that the word Tersai, "according to Trigautius, must be either Arabic or

Persic, not Armenian." The quotation from Trigautius, inserted above, does not justify such an interpretation: that writer merely remarks, that he is ignorant of the cause of the appellative Tersai, but inclines to believe, on satisfactory grounds, in its connexion with the Armenian; since he was informed by a certain Armenian, that in Persia the Armenian Christians were styled by that name. Besides this, no mention whatsoever, either of Arabic or Persic, occurs in the whole passage out of Trigautius. The statement of the Professor is, therefore, inaccurate; as he attributes to Trigautius an expression, which belongs properly to Assemanus. By an oversight alone of Mr. Lee the error could have escaped detection.

In the next place, the origin and signification of the name demand some attention. There is every reason to suppose that Tersai is a compound word, formed of *Ter* and *Isai*—the *I* being dropped in the coalescence. Assemanus, no doubt, was well aware of this combination; but he has only explained the latter term Isai, which he says denotes something belonging to Jesus, in the Persian and Arabic languages. With regard to the prefix *Ter* he has preserved an unaccountable silence; evidently not having found a homophonous word in either of those tongues to suit the purpose. His favorite Syriac failed likewise to help him in the present emergency. Were I permitted to hazard an opinion in this case, I would assign the derivation of the term to Armenian, in which language *Ter* signifies Lord. The appellation Tersai then would be equivalent to "Lord-Jesusites," and the Saracens or Mahomedans might very appositely call the Armenian Christians by that name, since to this day the expression *Ter-Iesous* is extensively used by the Armenians. I am uncertain, how far the explanation now given will prove acceptable to the philologists in general; but, without such an assumption, the difficulty can scarcely be remedied, or, at least, the subject be reduced to a reasonable meaning. Whilst upon this inquiry, I may notice the great similarity existing between *Chazinzanii*, by which the Armenians were denominated by the Tartars, according to Muller, and the Armenian word *chatch* or *khatch*, a Cross, with its derivatives—answering to the Greek *Staurolatræ*. This explanation derives further support from the "Historia Chatzitzariorum," written by Demetrius Cyzicenus, who flourished about the eleventh century. See Cave, Historia Literaria, vol. II. Dissert. I. p. 6.

The objection of Assemanus against the intercourse of Armenians with China ought to be admitted with some restriction. It is true

numerous records are extant to the effect, that Nestorian Missionaries have, in early ages, settled in that region, where they appear to have propagated the doctrines of their sect, with varying results. The monument of Siganfu, illustrated by Kircher, Assemanus, Bayer and others, presents a history of the fortunes of the Syro-Sinic Church. But that fact, by no means invalidates the question about the word Tersai. According to the testimony of Trigautius, the appellation was originally employed by the Saracens to designate Armenian Christians, and afterwards introduced by the Tartars among the Chinese, at the period of their settlement in that region. The term, moreover, can lay no claim to be considered as originating from the Chinese; for, we are informed by the same writer, that in the language of the " Celestial empire," the Christians were styled *Hoei*—a circumstance remarked by Muller, Assemanus himself and others. Concerning the relation of the Armenians with the Persians, Saracens and Tartars, proofs are in existence, which strongly and irrefragably bear out the point. As early as the fifth century the Armenians engaged in religious warfare with the Persians on account of the faith of Christ. A minute and faithful narrative of the whole transaction has been transmitted to us by Elisæus, Bishop of the Amatunians, an English version of which, made by Professor Neumann, was published by the Oriental Translation Committee in 1830. The subsequent history of Armenia presents a series of struggles or perpetual hostility with the Moslem powers for the protection of the Christian religion. The commendable spirit of the Armenians in refusing to accept the Koran, has subjected them and their country to miseries and devastations from the fanatical followers of the Prophet of Mecca. And who, but the Saracens, could admire their courage in the cause of their God, and style them with propriety the true believers of the Lord Jesus—*Tersai*. Under the descendants of Genghiz Khan, the state of things improved, only at times. According to Haithon (Historia Orientalis, sive de Tartaris, c. xxiv.) Mango Khan became a convert to Christianity, and received baptism at the hands of an Armenian Bishop. Many nobles followed the example of their king, and thus encouragement and support were extended to the Armenian persuasion. The visit of Hethum I., prince of the Cilicio-Armenian kingdom, to the great Khan of Tartary, the said Mango, in 1254, procured considerable immunities to the Christians of Armenia in general. A contemporary historian, Kirakus Ganzakensis, has given an interesting account of the progress of Hethum, which has been

translated into French by M. Klaproth, and inserted in the "Nouveau Journal Asiatique" for the month of October, 1833. This mission of the Armenian king is likewise mentioned by an anonymous Syriac writer in the continuation of the Chronicle of Gregory Bar-Hebræus or Abulpharagius (apud Asseman. vol. IV. p. 125.) We are informed by William de Rubruquis, the Minorite Friar, whom Louis IX. king of France, sent on an embassy into Tartary, about 1253, that he found several Armenian priests in the retinue of Mango Khan near the Chinese frontier. From these testimonies, there is reason to infer that Armenian Christians penetrated into China during the invasion of the Tartars. Many valuable particulars in further illustration of this matter are contained in the productions of early writers; such as Vincentius Bellovacensis (Speculum Historicum,) Marinus Sanutus (Secreta Fidelium Crucis,) S. Antonius Florentinus (Summa Historialis) and others. In conclusion, it seems very evident that Tersai is a word compounded from the Armenian *Ter*, and the Persian *Isai*, and that the term was employed by the Persians and Saracens, in direct reference to the Armenian Christians.

IV.—NOTICES.

Effects of Lightning.

On the morning of the 4th April 1848, between 3 and 4 o'clock, a bungalow at Palaveram, occupied by Assistant Apothecary Yaull, was struck by lightning. The electric fluid appeared to have entered through the roof, the tiles being perforated and the palmira rafters splintered. Its course continued half way down the wall marking its way by a deep fissure, whence it spread itself, injuring the globe lamp and extinguishing the light. The table underneath was damaged, and its legs, which were attached by iron hinges, likewise injured. The fluid was then traced in an opposite direction, having passed through an open door leading to a bed room, within which Mrs. Yaull and three children were sleeping. The door was split from top to bottom along the frame work near the hinges, the floor damaged in several places, and part of the plaster removed from the wall. Near this place, opposite to the bed, hung a pair of pistols and flask containing a few ounces of powder, which exploded, driving the head of the flask to the opposite side of the room, which was indented, and rebounding, fell near Mr. Yaull's head, between whose pillows it was found. The stocks of both pistols were somewhat injured, and the

silver ornaments upon them slightly melted: the fluid then made its exit through the venetian of a window near. A relation of Mr. Yaull, and who occupied a bed in the hall, was awake at the time, and temporarily paralyzed, and for some time after his memory was confused. The fragments of the powder flask and the perforated tile are deposited in the Polytechnic Institution.

Phosphorescence of the Sea.

Letters from Aden mention a singularly striking manifestation of luminousness on the sea observed by the passengers by the *Moozuffer* on the 23d January, 1849, when about half way to Aden. The surface of the water at once became smooth and glassy, as if oil had been poured on it,—and was overspread with a sheet of pale greenish light as far as the eye could reach. The steamer lost speed, and masses of sea-weed were seen floating in all directions around. The thin clouds on the horizon reflected back the light, presenting an appearance similar to that witnessed in northern latitudes when the Aurora fills the air.—*Bombay Telegraph, January*, 1849.

V.—Proceedings of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House on Tuesday, the 7th September, 1847, *at 7 o'clock* P. M.

PRESENT.

Chairman.

Walter Elliot, Esq.

Member.

J. Ouchterlony, Esq., and

Captain J. J. Losh, *Secretary.*

Read Extract from Minutes of Consultation in the Public Department, No. 822, dated 4th September, 1847.

Public Department.

No. 822.

Extract from the Minutes of Consultation, dated 4th September, 1847.

Read the following letter from the Secretary to the Madras Literary Society, and Auxiliary of the Royal Asiatic Society.

Here enter 26th August, 1847.

The Government have no objection to the publication in the Society's Journal, of Reports of a scientific character, selected from the records of Government, and from those of other public offices, as proposed by the Society, to a limited extent, and submitted, in the first instance, to the Government; but, before engaging to incur any expense on this account, they request to be furnished with the statement proposed to be submitted in the concluding para. of the foregoing letter.

(A true extract.)

(Signed) J. F. Thomas,
Chief Secretary.

To

The Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

I. *Resolved,*—That inquiry be made as to the probable expense of printing the paper regarding the gold mines in Malabar, revised by the Chairman of the Committee, in the forthcoming number of the Society's Journal; and that, as soon as the required information on this point is obtained, the paper be forwarded for the perusal of Government, with the statement called for: further, that it be intimated that the Committee propose, also, to publish the Report of their Sub-Committee on the collection of Native MSS. in the Society's charge, which was forwarded to Government in January last, and that permission be solicited to submit to the Civil Auditor, periodically, bills for the cost of printing the above, and other Government papers, in the Society's Journal.

Read letter from the Senior Secretary to the Asiatic Society of Bengal.

To

The Secretary to the Madras Literary Society.

Sir,

I have the honor to enclose the receipt held by this office for the parcels containing the books referred to in your letter of the 25th June, and which were duly forwarded to you by the Steamer "*Bentinck,*" on her June voyage.

I have, &c.

Asiatic Society, 6th *August*, 1847. (Signed) W. B. O'Shaughnessy,
Senior Secretary Asiatic Society.

The Committee observe that the parcel adverted to has been duly received, and that, as expected, its contents were found to be the Academical publications of the Royal Bavarian Academy, mentioned in the letter from the Secretary to that Institution, dated Munich, 10th May, 1846.

II. *Resolved,*—That the publications in question be deposited in the Library, and included in the next catalogue.

* Dated 31st July, 1847.

Read letter * from Messrs. Thacker and Co., Calcutta, forwarding a statement of their account, amounting to Rupees 106-8, and requesting an order for the amount.

The Committee observe that the former statement of account, referred to by Messrs. Thacker and Co. as rendered on the 20th May last, was forwarded, according to its address, to Assistant Surgeon Jerdon.

III. *Resolved,*—That this be intimated to Messrs. Thacker and Co., and that they be requested to forward a statement of the items of their account, to enable the Committee to judge if any of them are chargeable to the Society, or if the whole, as before supposed, is a private account with the late Secretary Mr. Jerdon.

Memo.

Of a Copy of Blackwood's Magazine for June, 1847, which was first circulated to Lieut. Colonel Pratt, C. B., second to Captain Biden, and third to Captain J. J. Losh, pages 703 and 704, and pages 727 to 730 have been torn out.

In the Journal of the Asiatic Society of Bengal for May, 1847, pages 401 to 408, inclusive, are wanting.

The volume of "Maxwell," herewith sent, was returned to the Library by G.F. Fullerton, Esq., in its present condition, with pages 15 and 16 missing. On the book being sent back to Mr. F. he sent the accompanying note.

Read Memorandum from the Librarian.

IV. *Resolved,*—That the Secretaries to the Asiatic Society of Bengal be requested to forward the deficient leaves of No. V. (new series) of the Society's Journal; and that Mr. Fullerton and Captain Biden be applied to, with reference to the 3d Rule for the Library of the Society, which must be enforced, unless a satisfactory explanation be furnished.

Laid on the Table 19 of the printed notices recently issued by the Committee, on the subject of the Society's Journal, which have been returned from stations in the Mofussil, with lists of new Subscribers to the Journal; and also a general list of the old and new Subscribers, the latter amounting to 54 according to the last received accounts.

Read letters from Messrs. Wm. H. Allen and Co., dated 17th and 19th July, 1847, advising the despatch of books per "*Wellesley,*" and of periodicals per Steamer for the Society.

V. *Resolved,*—That the receipt of these letters and of the periodicals alluded to, be acknowledged, and that they be requested to send out the following works for the use of the Society.

Guizot's History of Civilization, 3 vols.

McCulloch's Account of the British Empire.

Schlosser's History of the 18th Century, translated by Davison, 4 vols.

The Commissioner De Lunatico Inquirendo, 1847.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of sub-

scriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal, Nos. 30 and 31, have been received from the following Gentlemen since the last monthly Meeting of the Committee, held on the 3d August, 1847.

A. Hamilton, Esq., Nos. 30 and 31,....................Rupees 4 0 0

VI. *Resolved,*—That this Memorandum be recorded.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secy. M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 5th October, 1847, *at* 7 *o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Lieut. Colonel O. FELIX,
R. H. WILLIAMSON, Esq., and

Captain J. J. LOSH, *Secretary.*

Read letter from Messrs. Thacker and Co., dated St. Andrew's Library, Calcutta, 9th September, 1847, forwarding, as requested, a statement in detail of their account with the Society, showing a balance unpaid of Rupees 106-8-0. Read also Memorandum from the Librarian in explanation of the above account.

The Committee observe that of the above sum the Society is only responsible for the sum of Rupees 36-12, the balance of Rupees 69-12 being apparently the price of 5 copies of the 4th volume of the Alif Laila furnished by Messrs. Thacker and Co. to His Highness the Rajah of Mysore.

I. *Resolved,*—That intimation to the above effect be made to Messrs. Thacker and Co., and also that they be requested to forward a list of the Nos. of the Society's Journal in their possession not yet disposed of.

Read letter from W. Earle, Esq., Curator, Calcutta Public Library, dated 8th September, 1847, requesting that a complete collection of the transactions of the Madras Literary Society (of which only the first

part is in the Public Library at Calcutta) may be transmitted by the next Steamer or by a sailing vessel, and stating that, if necessary, the publication will be gladly paid for.

II. *Resolved,*—That as a complete set of the numbers of the Society's Journal cannot at present be furnished from Madras, this application be reconsidered on the receipt of the expected communication from the London Booksellers respecting the numbers of the Journal remaining in their possession.

Read letters from Messrs. Wm. H. Allen and Co., dated 19th and 24th August, 1847, the former advising the periodicals and books per Steamer, and the latter announcing the receipt of a bill of £100 Sterling.

III. *Resolved,*—That the receipt of these letters and of the periodicals and books alluded to be acknowledged, and that Messrs. Allen and Co. be requested to send out the following works for the use of the Society.

Lord Castlereagh's Narrative of His Journey to Damascus.
Travels in Central America, by G. R. Dunlop, Esq.
Narrative of a Journey in the interior of Africa, by John Duncan.

Laid on the table 15 of the printed notices recently issued by the Committee on the subject of the Society's Journal, which have been returned from Stations in the Mofussil, with lists of new Subscribers to the Journal, amounting to 75 according to the last received accounts.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal since the last Meeting is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentlemen since the last monthly Meeting of the Committee, held on the 7th September, 1847.

Captain R. S. Dobbs, Nos. 30 and 31,................	Rupees	4	0	0
H. Stokes, Esq., No. 31, two copies,..................	,,	4	0	0
	Rupees...	8	0	0

IV. *Resolved,*—That this Memorandum be recorded.

(Signed) Walter Elliot, *Chairman.* (Signed) J. J. Losh, *Secy. M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Wednesday, the 10*th November*, 1847, *at* 7 *o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Lieut. Colonel O. FELIX,
Lieut. Colonel T. S. PRATT, C. B.
Lieut. Colonel W. WATKINS, and

Captain J. J. LOSH, *Secretary.*

Read letter from the Chief Secretary to Government, dated Fort St. George, 5th October, 1847.

FORT ST. GEORGE, *5th October*, 1847.
PUBLIC DEPARTMENT.
No. 921.

GENTLEMEN,

1. In acknowledging the receipt of your Secretary's letter of the 25th ultimo, I am directed to acquaint you that the Government have no objection to the publication, as proposed, of the report of the Sub-Committee referred to in its 6th paragraph, and that they are prepared to take 30 copies of each number of the Society's Journal.

2. I am desired to transmit a Report* drawn up by Mr. Robinson, Assistant Collector of Canara, on the general condition and resources of the Laccadive Islands attached to that District; and as it contains so much new and interesting information, to suggest the expediency of its being inserted in the Society's proposed Publication.

3. The paper which accompanied the letter under acknowledgment is herewith returned, as requested.

I have, &c.
(Signed) J. F. THOMAS,
Chief Secretary.

To
The Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

I. *Resolved,*—That the receipt of this letter be acknowledged, and that Government be informed, with reference to the last paragraph, that the

* To be returned when no longer required.

report which accompanied it was not received in time to be inserted in the number of the Society's Journal now passing through the press, but that it is proposed to publish it, with some trifling omissions of official details, in the next number of the Journal, and that it will be returned, as directed, as soon as a copy has been completed to print from.

The Chairman undertakes to have a copy prepared accordingly.

Read letter from H. Cope, Esq., Secretary to the Archæological Society of Delhi, dated Delhi, 6th October, 1847.

SIR,

I have the honor to acknowledge the receipt of your letter and of those of the following Nos. of the Madras Journal of Literature and Science, viz., 1, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, and 31.

These I had the pleasure to lay on the table at the last Meeting of the Archæological Society of Delhi, and am desired to return their best thanks to the Madras Literary Society, for this most valuable contribution to their Library. The Society is also under obligations to the Madras Institution for their liberal promise to complete the set of the Journal by forwarding the missing Nos. 2, 3, 4, 5, 12, and 13, and hope, ere a short time, when the publication of their own proceedings may commence, to be in a position to return the compliment so liberally paid to us.

I have, &c.

(Signed) HENRY COPE,

Archæological Society of Delhi.

DELHI,
6th Oct. 1847.

II. *Resolved*,—That this letter be recorded, and that copies of Nos. 2, 3, 4, 5, 12 and 13 be transmitted to the Archæological Society of Delhi, with a copy of No. 32 as soon as possible after the publication of the latter.

Read letter from Captain Biden, dated Madras, 15th October, 1847, and letter from G. F. Fullerton, Esq., dated 8th October, 1847.

To

J. J. LOSH, Captain,

Secretary Madras Literary Society.

SIR,

In reply to your letter of the 13th ultimo, which I received yesterday, I beg leave to assure you that I have no recollection of the periodical you allude to being received at my house or passed to another Subscriber in a mutilated condition. I have always been in the habit of taking the greatest care of books, whether belonging to me or to any

other party, when in use by myself or family, therefore I have no hesitation in saying that the No. of Blackwood's Magazine referred to, was neither injured nor mutilated by myself or by any member of my family.

I have, &c.

(Signed) CHRIS. BIDEN.

MADRAS,
15*th Oct*. 1847.

To

The Secretary to the Madras Literary Society.

SIR,

I beg to acknowledge the receipt of a letter from you, dated September, 1847. In reply, I beg to state that I cannot be certain that the pages 16 and 17 were missing from the book when sent to me, but as the book was by no means in good condition, I should think it not improbable that they were wanting.

With reference to the Rule to which you draw my attention, I can only hope that the loss of two pages from a work of the character of the one alluded to by you cannot be considered as a "serious injury."

I beg to remain,
Your's faithfully,
(Signed) G. F. FULLERTON.

III. *Resolved*,—Although there seems no reason to doubt that the book was complete when sent to Mr. Fullerton, and that the periodical in question sustained the injury adverted to, in the interval between its being forwarded to Captain Biden and received by the next Subscriber to whom it was passed, the Committee are of opinion that, under the circumstances of the cases, it would not be expedient to enforce the 3d Rule for the Library, and resolve, accordingly, that it be not enforced in the present instances.

Read Memorandum from the Librarian respecting the detention of books in circulation, in violation of the 6th Rule for the Library of the Society.

MEMO.

Books in circulation are often detained much beyond the time allowed for their perusal by the following gentlemen, who in consequence are generally furnished with books which have been read by other Members of the Society who are regular in returning them.

Sent to Major Anstruther, C. B.
11*th May*, 1847. The Baron's War (herewith sent) which was recently found by acci-

IV. *Resolved*,—That the Librarian be instructed to apply for the books not yet returned, and report to the Secretary when they are received for the information of the Committee.

In future whenever a work is detained in circulation double the time allowed for its perusal, the Librarian is to apply for it, and report the cir-

dent by the Chairman in the house of another gentleman.

Sent to T. V. Stonhouse, Esq., and not yet returned.

7th Sept. 1847. Lives of twelve Judges, 2 vols.

" * Stories from the Italian Poets, 2 vols.

Sent to Lieut. Col. W. Watkins, and not yet returned.

31st Aug. 1847. * The Debutante, 3 vols.

" * Bell's Life of Canning.

25th Sept. 1847. * History of the Punjaub, 2 vols.

* Since returned.

cumstance for the consideration of the Committee.

Read a Memorandum from the Librarian respecting the conduct of Sooboo Moodeliar, late a Subscriber, who has neither paid up his subscription, nor returned certain books belonging to the Library.

Lieutenant Colonel Pratt, C. B., having kindly undertaken to speak on the subject to the gentleman on whose recommendation Sooboo Moodeliar was originally admitted as a Subscriber.

V. *Resolved*,—That the consideration of this subject be deferred until the next monthly Meeting.

Read Memorandum from the Librarian stating that the belts of the Society's seven peons, which were supplied in 1843, are nearly worn out, and require to be replaced, and the price of two yards of blue cloth, which will be enough for the purpose, is Rupees six.

VI. *Resolved*,—That the Librarian be authorized to purchase the cloth required, and instructed to have the new belts made up as soon as possible.

Read letters from Messrs. Wm. H. Allen and Co., dated 13th and 18th September, 1847, the former advising the dispatch of periodicals and books per Steamer, and of a box of books per ship "*Vernon;*" and the latter, in compliance with the Committee's request, enclosing a statement of the copies of the Society's Journal remaining in their hands, showing a balance of £ 3-19-3 due to the Society for copies disposed of.

Resolved further,—That Messrs. Allen and Co. be requested to send out the following works for the use of the Library:

The Prose Writers of America, by R. W. Griswold, 1 vol., 8vo. with plates.
History of the Bank of England, by John Francis.
Pius IX. or the first year of the Life of a Pope.
Picturesque Illustrations of Ancient Architecture in Hindostan, by J. Fergusson.
Notes of a Residence in Rome in 1846, by a Protestant Clergyman.

VII. *Resolved*,—That the receipt of these letters and of the periodicals and books per Steamer, be acknowledged, and that Messrs. Allen

and Co. be informed that, instead of two numbers of the New Monthly Magazine for September, 1847, as stated in their invoice, only one number for that month, with one for August, has been received, and as two numbers of the Magazine for the latter month were before received, in due course, the Committee must decline to take the extra one, which will be retained on account of Messrs. Allen and Co. and disposed of as they think proper.

MEMORANDUM.

I have with me one copy of No. 12 and 4 copies of No. 13 of the Society's Journal, and if we get from our London booksellers (who state they have on hand) four copies of the two first volumes, and six copies of the 12th number (which latter is not procurable in Madras) the Society will have, after completing the sets sent to the Royal Society of Bavaria and the Delhi Archæological Society, at its disposal two complete sets of the Journal; and should we hereafter get three more copies of Nos. 2, 3, 4, 5, and 13, we can make up another three complete sets.

In order to supply the deficient numbers of the Journal to the Royal Society of Bavaria, and the Archæological Society of Delhi, we must get the two first volumes unbound and separated into numbers to furnish Nos. 2, 3, and 4 to the former Society, and Nos. 2, 3, 4 and 5 to the latter; or we might forward the bound volumes, and request them to return the numbers they have already received, and which are contained in the bound volumes. Besides these numbers we must also furnish these Societies with numbers 12 and 13.

Read Statement of the numbers of the Society's Journal forwarded to them to be disposed of; statement of the number of copies of each number of the Journal remaining in the Library, and Memorandum from the Librarian respecting the Journal.

The Committee observe that two complete sets of the Journal are required for transmission to the Royal Society of Antiquarians of the North at Copenhagen and to the Public Library at Calcutta respectively that copies of Nos. 2, 3, 4, 5, 12 and 13 are required for the Archæological Society of Delhi, and copies of Nos. 2, 3, 4, 12 and 13, for the Royal Society of Bavaria.

VIII. *Resolved*,—That steps be immediately taken to have such of the required numbers as are procurable ready for transmission to the parties abovementioned, with copies of No. 32 now passing through the Press, and that the Secretary be requested to draft replies to the letters from the President and Secretary of the Royal Society of Bavaria, dated Munich, 9th and 10th May, 1846, from the Secretary to the Royal Society of Antiquarians of the North, dated Copenhagen, 19th November, 1845, and from W. Earle, Esq., Curator of the Calcutta Public Library, containing intimations to the above effect. The numbers of the Journal destined for the Royal Society of Bavaria and the Royal Society of Antiquarians of the North will be sent to Messrs. Allen and Co., who will be requested to supply the deficient numbers, and forward the whole from London to their respective addresses. Messrs. Allen and Co. will, also, be instructed to forward to Madras four copies of the 1st

and 2d volumes, and six copies of the 2nd, and not to dispose of any more numbers without further instructions.

Laid on the table a printed list, containing the names of two new Subscribers to the Journal, which has been returned since the last Meeting.

The Committee observe that several of the printed lists have not yet been returned, so that more new Subscribers may be looked for.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following gentleman since the last monthly Meeting of the Committee, held on the 5th October, 1847.

Captain T. D. Roberts, No. 31, - - - Rupees 2 0 0

XI. *Resolved,*—That this Memorandum be recorded.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House on Wednesday, the 8th December, 1847, *at* 7 *o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Lieut. Colonel W. WATKINS,
R. H. WILLIAMSON, Esq., and
Captain J. J. LOSH, *Secretary.*

Read letter from Messrs. Thacker and Co. of Calcutta.

ST. ANDREW'S LIBRARY,
CALCUTTA, 10*th November*, 1847.

To
J. J. LOSH, *Esq.*
Secretary Literary Society,
Madras.

SIR,

We have been favored with your letter of the 25th ultimo, and beg to annex our account for Roxburgh's Flora Indica, and shall feel obliged by your paying the amount to Messrs. Binny and Co. of Madras.

We shall apply to the Rajah of Mysore for the price of the 5 copies of the 4th vol. of the Alif Leila, and have removed the charge from your account.

In compliance with your request we have the pleasure to hand you a list of the numbers of the Society's Journal which we have now in hand, and remain,

Sir,

Your faithful servants,

(Signed) Thacker and Co.

Madras Literary Society.		Dr.		
1845.		Rs.	A.	P.
Sept. 11th.	To Roxburgh's Flora Indica, 3 vols. - - - - - -	36	0	0
	Packing, &c. 8 As. and postage 6 As. - - - -	0	14	0
Messrs. Binny and Co.'s Commission for receiving and remitting the amount @ 2 per cent. 11 As. and postage 6 As. - - -		1	1	0
	Company's Rupees...	37	15	0

E. E. (Signed) Thacker and Co.

I. *Resolved,*—That Messrs. Binny and Co. be requested to transfer the sum of Rupees 37-15 from the credit of the Literary Society to that of Messrs. Thacker and Co., and that the latter be instructed not to dispose of any of the numbers of the Society's Journal remaining in their hands, without further instructions.

Read letter from William Elliot, Esq., Trichinopoly.

Captain Losh,

Secretary M. L. S., Madras.

Dear Sir,

I have the pleasure herein to return the paper, received with your note of the 30th June last, with seven new Subscribers' names. Trichinopoly does not exhibit a very scientific community. I have kept the list a long time in hopes of adding to it, but I believe a similar paper was circulated by the Brigadier without any success. If I can be of any assistance or service I shall be very happy to be informed of the same.

Believe me,

Your's faithfully,

(Signed) W. Elliot.

Trichinopoly,
18*th Nov.* 1847.

II. *Resolved,*—That this letter be recorded, with a view to its further consideration, should the Committee find it necessary to avail themselves of Mr. Elliot's kind offer of assistance or service, as regards the Society's Journal.

Read Memorandum from the Librarian respecting Mr. C. P. Brown's Subscription to the Library.

MEMO.

Mr. C. P. Brown has not paid his subscription (Rs. 44) to the Society for the last two quarters. He has desired the peon, without assigning any cause, not to bring the bills to him again.

The Committee take it for granted that Mr. Brown considers himself still exempted from paying his quarterly subscriptions under the Resolution at the Meeting on the 21st October, 1844. As, however, the Indian books and Manuscripts in the Society's charge are now under the care of persons employed by Government, and the descriptive catalogue of them which, it appears, Mr. Brown undertook to prepare, is under preparation by other hands, the Committee are of opinion that the Society is not liable to any expense whatever on account of the Native Library, and it was not intended that Mr. Brown should be exempted from the payment of his subscription after the employment of a regular Government establishment for the custody of the Manuscripts and books. Mr. Brown's payment of subscription should, therefore, have been resumed from the 1st February, 1845.

III. *Resolved,*—That the Secretary be requested to draft a communication to Mr. Brown on the above subject.

Read letter from Messrs. W. H. Allen and Co., dated 19th October, 1847, advising the despatch of periodicals and of books per Steamer.

IV. *Resolved,*—That the receipt of Messrs. Allen and Co.'s letter be acknowledged, and that they be requested to send out the following books for the use of the Society.

The Secret History of the Court and Government of Russia, under the Emperors Alexander and Nicholas, 2 vols., 8vo.

The Doctor, by Southey, vol. VII.

A Popular Account of the Manners and Customs of India, by the late Rev. T. Acland, No. 50 of the Home and Colonial Library.

Laid on the table two printed lists containing the names of ten new Subscribers to the Journal which have been returned since the last Meeting.

In conformity with the VII. Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentleman since the last monthly Meeting held on the 10th November, 1847.

H. Newill, Esq., Nos. 30 and 31, ...Rupees 4 0 0

V. *Resolved,*—That this Memorandum be recorded.

With reference to the V. Resolution at the last Meeting the Secretary reports that Sooboo Moodeliar has paid up his arrears of subscription, and promised to return the books in his possession belonging to the Library.

VI. *Resolved,*—That should the books not be duly returned as promised the Librarian be instructed to apply again to Sooboo Moodeliar for them, and report the result for the information of the Committee.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society, held on Tuesday, the 1st February, 1848, *at* 7 *o'clock* P. M.

Read letters from Messrs. Binny and Co., dated 21st and 23d December, 1847.

Read letter from Lieutenant Colonel T. S. Pratt, C. B., dated 15th December, 1847, forwarding a copy of Morrison's Chinese and English Dictionary, in 4 volumes, presented to the Society by Lieutenant G. N. Bredin, of H. M. 94th Regiment.

The Committee observe that these papers, which would have been considered at the Meeting in last month, had one taken place, have been already disposed of.

I. *Resolved,*—That the proceedings with regard to the subjects of the above letters be approved of.

The Secretary reports that the following letters have been despatched since the last Meeting of the Committee on the 8th December, 1847.

To

The Secretary to the Mathematical and Physical Class of the Royal Academy of Bavaria.

SIR,

1. I have the honor, by desire of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, to acknowledge the receipt of letters as per margin,* under your signature, and also of the Academical publications therein adverted to, which had been sent to the care of H. Torrens, Esq., Vice President of the Asiatic Society of Bengal, and for which the Committee beg to return their best thanks in the name of the Society. The box containing the latter was received on the 30th June, 1847.

* From the President of the Royal Society of Bavaria to the Madras Literary Society and Auxiliary of the Royal Asiatic Society, dated Munich, 9th May, 1846, with postscript signed by the Secretary of the Mathematical and Physical Class, dated Munich, 10th May, 1846.

2. The Managing Committee have delayed acknowledging the receipt of the letters, and publications, above-mentioned, until the present time, because they could not before supply the numbers of the Literary Society's Journal required to complete the set furnished to the Royal Society of Bavaria, and further, because they were in hopes of being able to obtain some objects of natural history or dried plants, which might be acceptable to the Royal Society.

3. The latter object they have not yet been able to accomplish; but they have the pleasure to forward herewith numbers, as per margin, of the Literary Society's Journal, which will complete the set supplied to the Royal Society of Bavaria. The parcel containing the periodicals is addressed to Messrs. Wm. H. Allen and Co., Booksellers, No. 7, Leadenhall Street, London, who will either deliver it to the Royal Society's Agent, in London, or forward it to Munich, as circumstances may require.

Nos. 2, 3, 4, 12, 13 and 32.

4. The publication of the Madras Quarterly Medical Journal, mentioned in the letter under acknowledgment, with which the Madras Literary Society had no connection, has been discontinued since 1843.

5. In conclusion the Managing Committee beg to express their sense of the honor conferred on the Madras Literary Society by the offer of the Royal Society of Bavaria to keep up a literary intercourse, of which the Managing Committee will not fail to avail themselves.

The further supply of the publications of the Royal Society of Bavaria promised in the letters under acknowledgment will be thankfully received, on account of the Madras Literary Society.

I have the honor to be,

Sir,

Your most obedient humble servant,

(Signed) J. J. Losh,

Secretary M. L. S. &c.

Madras,
13*th January*, 1848.

To

The Secretary to the Royal Society of Antiquarians of the North, Copenhagen.

Sir,

1. I have the honor, by desire of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, to acknowledge the receipt in the early part of last year of the letter* under your signature, dated Copenhagen, 19th November, 1845, with the publications therein mentioned, for which the Committee beg to return their best thanks in the name of the Madras Literary Society.

* From the Royal Society of Antiquarians of the North to the President of the Madras Literary Society.

2. In compliance with your request, acknowledgment of the receipt of the letter and publications above-mentioned has been postponed until the present time, when the Managing Committee are able to offer for the acceptance of the Royal Society of Antiquarians of the North a complete set* of the Madras Literary Society's Journal, which has accordingly been sent to Messrs. W. H. Allen and Co., Booksellers, No. 7, Leadenhall Street, London, who will take measures for transmitting the parcel to your Agents, Messrs. Hambro and Son.

* Nos. 1 to 32.

3. In conclusion the Managing Committee beg to express their hope that the Madras Literary Society may be favored with further supplies of the very interesting memoirs and other publications of the Royal Society of Antiquarians of the North.

I have the honor to be, &c. &c.,
(Signed) J. J. Losh,
Secretary M. L. S. &c.

Madras,
13*th January*, 1848.

To the Curator, Calcutta Public Library, dated 5th January, 1848, acknowledging receipt of his letter, dated 8th September, 1847, and forwarding numbers of the Literary Society's Journal.

To H. Cope, Esq., Secretary to the Delhi Archæological Society, dated 5th January, 1848, forwarding numbers of the Literary Society's Journal.

To Lieut. G. N. Bredin, of H. M. 94th Regiment, dated 13th January, 1848, conveying the thanks of the Committee, on behalf of the Literary Society, for his valuable donation of Morrison's Chinese and English Dictionary.

II. *Resolved*,—That the proceedings with regard to the above correspondence be approved of.

Read Memorandum of the Librarian regarding the book lost by Sooboo Moodeliar.

Memo.
Sooboo Moodeliar has sent a person to say that he has lost the two volumes of Chalmers on the Constitution of Man, and that he will pay the price of the same.
The Invoice price of the work is £1—3—0

The Chairman reports that he has ascertained that the 2d volume of the copy of Hamilton's Hindostan, belonging to the Society's Library has been lost.

The Secretary reports that several books included in the Catalogue of the Society's Library are not to be found therein. In particular

Sheridan's Dramatic Works*, and the Life of Genghis Khan, and the books, as per margin, for which John Sullivan, Esq., is responsible, as admitted in his letter to the late Secretary, dated 2d February, 1844, the last communication received from him on the subject.

* N. B. A copy of this work has just been received from the Booksellers to replace the missing one.

Histoire Naturelle par Buffon, vols. 1, 2, 3 and 4.
Oeuvres de Montesquieu, 6 vls.
Mechanics' Magazine, vol. 23d.
Asiatic Annual Register for 1809.

III. *Resolved*,—That the Librarian be directed to prepare, for consideration at the next Meeting, a list of all the books included in the Catalogue but not to be found in the Library, with as full an explanation as possible, regarding the time and manner of their disappearance and what parties are responsible for them.

Read letter from Messrs. Wm. H. Allen and Co., dated 18th December, 1847, advising the despatch of periodicals and of books per Steamer.

IV. *Resolved*,—That the receipt of Messrs. Allen and Co.'s letter be acknowledged, and that they be requested to send out the following books for the use of the Society:

The Douglas Case. The reports of the decision on the disputed succession to the Douglas Peerage.

Borneo and Labuan, by Captain Sir E. Belcher.

England under the House of Hanover, by T. Wright, Esq., F. A. S.

Read letters from Messrs. Thacker and Co., Calcutta, dated 4th and 19th January, 1848, from Messrs. Binny and Co., dated 4th January, 1848, and from E. B. Powell, Esq.,* notifying his retirement from the Committee in consequence of his approaching departure from Madras for the benefit of his health.

* Received 24th Jan. 1848.

V. *Resolved*,—That they be recorded.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the Table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following gentleman since the last monthly Meeting of the Committee held on the 8th December, 1847.

Major General M. Cubbon, Nos. 30 and 31,..................Rupees 4 0 0

VI. *Resolved*,—That this Memorandum be recorded.

(Signed) Walter Elliot, *Chairman.* (Signed) J. J. Losh, *Secy. M. L. S. &c.*

At a Meeting of the Managing Committee, of the Madras Literary Society, held at the Club House on Saturday, the 11*th March,* 1848, *at 7 o'clock* P. M.

A general statement of the Society's accounts, for 1847, is laid on the table.

I. *Resolved,*—That this general statement of accounts be approved and passed, and laid before the next Annual General Meeting of the Subscribers; which, according to the revised 13th Rule, should be convened as soon after this Meeting as convenient. Accordingly, *Resolved,* further, that the President, Sir E. J. Gambier, be requested to name some day in the present month for the Annual General Meeting, or should he be unable to attend, that one of the Vice Presidents be asked to fix a day for the Meeting and to preside at it.

The Account Current of Messrs. Binny and Company with the Society for 1847 is laid on the table, with the letter which accompanied it, dated 3d February, 1848.

II. *Resolved,*—That Messrs. Binny and Company be informed that their Account Current has been examined and found correct, and that it be laid before the General Annual Meeting.

Read letter from the Honorable D. Eliott, Esq., dated 21st February, 1848, intimating his acceptance of the office of Vice President to the Society.

III. *Resolved,*—That this letter be recorded.

Read letter from Mr. Samuel Marcar forwarding, for the acceptance of the Society, a parcel containing a book and pamphlet as per margin.

"Bibliographia Armeniaca," or a Catalogue Raisonné of Armenian Books.
General Observations on Armenia.

IV. *Resolved,*—That the book and pamphlet be accepted, and that Mr. Marcar be thanked, on behalf of the Society, for his present to it.

Read letter from W. Middlemass, Esq., dated 21st February, 1848, intimating his retirement from the Managing Committee, in consequence of his immediate departure for Europe.

V. *Resolved,*—That this letter be recorded.

MEMO.
The business of the Society's Library being now much augmented, the Librarian begs respectfully to bring the same to the notice of the Committee, and begs that an Assistant to him,

Read Memorandum from the Librarian requesting, for reasons stated, that he may be allowed the aid of an Assistant, on a small monthly salary, and that the person who has hitherto assisted him without remuneration may be appointed to the situation.

on a small pay, may be granted. As the Stock of the Library increases annually it will be obvious to the Committee that the business also increases. About two or three hundred volumes are daily being issued from the Library, and the Librarian, under such circumstances, begs that a person may be appointed solely for this business, while he will have to conduct the rest of the business, namely, to keep the accounts of the Society, carry on the correspondence with the Subscribers, attend upon those who visit the Library, superintend the book-binding department, &c. &c. Should the Committee have no objection, the Librarian begs he may be permitted—in the event of this request being complied with—to entertain the party who has hitherto assisted him in business.

VI. *Resolved,*—That as the services of an Assistant Librarian appear obviously necessary, the request of the Librarian be complied with.

The pay of the Assistant is fixed at Rupees fifteen per mensem, and his employment will commence on the 1st proximo.

Read letter from the Officiating Chief Secretary to Government, dated 8th February, 1848, transmitting for the use of the Society, copy of the VII. volume of the Madras Astronomical Observations.

VII. *Resolved,*—That the book in question be deposited in the Library.

Read letter from the Librarian Calcutta Public Library, dated 28th January, 1848, acknowledging receipt of 28 numbers of the Society's Journal, offering the grateful acknowledgments of the Curators for the kind and useful donation, and forwarding a catalogue of the Calcutta Library for the acceptance of the Society.

VIII. *Resolved,*—That the letter be recorded, and that the catalogue which accompanied it be laid on the Library table.

Copy of the bill for printing 350 copies of (No. 32) the Madras Journal of Literature and Science presented for payment by the Superintendent of the Christian Knowledge Society's Press, is laid on the table.

IX. *Resolved,*—That this bill amounting to Rupees 480-4-10, be discharged, and that the cost of publishing the Journal, and sums received on account of it, be included in the regular accounts of the Society.

Memo.

According to the old Rules of the Society (vide Catalogue of 1834, Rule xii.) when a Subscriber at the

Read Memorandum, from the Librarian, requesting instructions as to whether Gentlemen who have, at some for-

Presidency withdraws his name from the list of Subscribers, and wishes after some time to rejoin the Society, he ought to be recommended again for admission and pay his entrance money. Mr. W. E. Underwood was formerly a Member of the Society and withdrew—he has again joined the Society on his own application, and on the recommendation of the Secretary has been admitted a First Class Subscriber of the Society. Under these circumstances is Mr. Underwood to pay a second entrance donation of Rupees 35?

mer period, been Subscribers and paid the entrance donation, are, on re-admission, required to pay it again.

X. *Resolved,*—That under the present regulations, entrance donation cannot be demanded from a Subscriber on re-admission unless he had either been expelled, or had formally desired his name to be withdrawn from the list of Subscribers.

Read list of books included in the Catalogue but not to be found in the Library, prepared in conformity with the 3d Resolution at the last monthly Meeting.

LIST OF BOOKS INCLUDED IN THE CATALOGUE OF THE SOCIETY BUT NOT IN THE LIBRARY.

Time of disappearance.		*Parties considered responsible for the loss.*
11th Dec. 1827,	Blackwood's Magazine, vols. 13 and 14,	Capt. M. C. Chase.
20th Jan. 1831,	Galt's Letters from the Levant,	Lieut. P. Anstruther.
28th ,, ,,	Abdul Feda de Vita et rebus Gestis Mahommedis,	Capt. M. J. Rowlandson.
12th Nov. 1832,	Sheridan's Dramatic Works, 2 vols.	Capt. D. Montgomerie.
18th June 1834,	Moreau's Chronological Records of the British Royal and Commercial Navy (in a sheet),	H. Chamier, Esq.
31st Mar. 1835,	Quarterly Review, vol. 16th,	H. V. Conolly, Esq.
8th Dec. ,,	Criminal Trials, vol. 1st,	A. Rowlandson, Esq.
28th Feb. ,,	Eustace's Tour through Italy, vol. 1,	T. R. Wheatley, Esq.
,, ,, ,,	Memoirs of Marshal Ney, vol. 2d,	Do.
26th July 1836,	Twenty-five years in the Rifle Brigade,	J. Ouchterlony, Esq.
4th Mar. 1837,	Love Letters of Mary Queen of Scots,	Do.
11th Aug. ,,	Elme's Lectures on Architecture,	Major Ross.
1st Nov. ,,	Wood's War in Mysore,	Capt. G. W. Whistler.
21st Sept. 1840,	Memoirs of Hannah More, 4 vols.	Ven. Arch. Harper.
15th July ,,	Kennedy's Notes on Cholera,	Dr. Murray.
3d Mar. ,,	Fraser's Travels on the Shores of the Caspian Sea,	G. Norton, Esq.
27th ,, 1841,	Cochrane Chess,	Do.
29th Aug. 1842,	Paul's Letters to his Kinsfolk,	Do.
23d Oct. 1841,	Junius's Letters,	Capt. J. T. Smith.
24th Sept. 1842,	Rennell's Geography of Herodotus,	T. M. Lane, Esq.
26th June 1844,	Jones's Institutes of Menu,	Do.
3d Aug. ,,	Malthus's Definitions in Political Economy,	Do.
13th July 1843,	Edinburgh Review, vol. 74,	W. A. Morehead, Esq.
30th June ,,	Captain Bonneville's Adventures, 3 vols	W. Middlemass, Esq.

Time of disappearance.		*Parties considered responsible for the loss.*
26th May 1843,	Edgeworth's Practical Education, 2 vols.	A. Robertson, Esq.
2d Feb. 1844,	The Menageries 1838,	Lord Arthur Hay.
26th ,, ,,	Plays by Knowles, 1 vol.	Do.
4th Apr. 1845,	Night and Morning, 3 vols.	R. O. Campbell, Esq.
,, ,, ,,	Lady Hervey's Letters,	Lieut. Col. Forster.
3d Mar. ,,	Reliques of Ancient English Poetry, vol. 3d,	R. S. Ellis, Esq.
18th Jan. 1844,	The English Fireside, 3 vols.	G. Harding, Esq.
4th Oct. ,,	Chatsworth, 3 vols.	W. H. Rose, Esq.
12th Aug. 1843,	The Jewess,	A. Maclean, Esq.
31st July 1847,	Chalmers on the Constitution of Man, 2 vols.	C. Sooboo Moodeliar.
29th Oct. 1839,	Homeward Bound, 3 vols.	Lost by the dishonesty of a Peon.
,, ,, ,,	Mitchell's Eastern Australia, 2 vols.	
7th ,, ,,	Melton de Mowbray, 3 vols.	
10th Aug. ,,	Pictures of the World, 3 vols.	
25th Sept. ,,	The Only Daughter, 3 vols.	
18th ,, ,,	Mrs. Jameson's Rambles in Canada, 3 vols.	
28th Oct. ,,	Gladstone's Church, &c.	
30th ,, ,,	Head's Narrative.	
31st ,, ,,	Miller on Law, (replaced by Sir R. Comyn.)	
4th Nov. ,,	Dunlop's Drinking Usages.	
24th Sept. ,,	Gurwood's Despatches, vol. 8, (replaced by the Society.)	
25th Oct. ,,	Alison's French Revolution, vol. 7, (replaced by the Society.)	
13th Sept. ,,	The Husband Hunter, 3 vols.	
21st Oct. ,,	Ella, 3 vols.	
7th ,, ,,	Oliver Twist, 3 vols., (replaced by the Society.)	
29th ,, ,,	Travels in Town, 2 vols.	
20th ,, ,,	Lockhart's Life of Sir W. Scott, 1st vol., (replaced by the Society.)	
22d ,, ,,	Bryce on Native Education.	
31st ,, ,,	Chapman's Hindu Female Education.	
29th Aug. 1831,	The Tuilleries, 2d vol.	Sir J. Doveton, G. C. B.
	Walladmor, vol. 2d lost,	H. V. Conolly, Esq.
	Library of Romance, vols. 8 and 9 lost.	
	Hamilton's Hindostan, vol. 2d lost.	
	The Art of Prolonging Life.	
	History of Genghis Khan,	Destroyed by White Ants.
19th Mar. ,,	Memoirs of Sebastian Cabot,	Captain Bradford.
22d July ,,	Lee's Memoirs of Baron Cuvier.	J. Barrow, Esq.

Time of disappearance.		*Parties considered responsible for the loss.*
28th July 1833,	Boaden's Memoirs of Mrs. Inchbald, 2 vols.	W. Bathie, Esq.
	Paris in 1802 and 1814.	
	Chatham's Letters.	
	Hannah More's Works, vol. 3d,	Colonel Snow.
1st May 1823,	Specimens of Irish Eloquence,	J. Annesley, Esq.
8th Feb. 1833,	The Sketch Book of Fashion, 3 vols.	Sir T. Sevestre.
17th July ,,	Wondrous Tale of Alroy, 3 vols.	J. A. Hudleston, Esq.

The Committee observe that some of the above works have been replaced at the expense of the Society, some have been paid for by the parties who lost them, and some, which will be accordingly struck out of the Catalogue, it seems unnecessary to replace.

XIII. *Resolved*,—That measures be adopted to replace the following missing works and volumes as soon as possible.

Histoire Naturelle, par Buffon, vols. 1, 2, and 4.	Malthus' Definitions in Political Economy.
Oeuvres de Montesquieu.	Edinburgh Review, vol. 74.
Mechanics' Magazine, vol. 23d.	Captain Bonneville's Adventures.
Asiatic Annual Register for 1809.	Edgeworth's Practical Education.
Blackwood's Magazine, vols. 13 and 14.	The Menageries 1838.
Mercau's Chronological Records of the British Royal and Commercial Navy.	Plays, by Knowles, 1 vol.
Quarterly Review, 16th vol.	Night and Morning.
Criminal Trials, 1st vol.	Lady Hervey's Letters.
Eustace's Tour through Italy, 1st vol.	Reliques of Ancient English Poetry, vol. 3d.
Specimens of Irish Eloquence.	The English Fireside.
The Sketch Book of Fashion, 3 vols.	Chalmers on the Constitution of Man.
Memoirs of Marshal Ney, 2d vol.	Mrs. Jameson's Rambles in Canada.
Twenty-five years in the Rifle Brigade.	Gladstone's Church, &c.
Love Letters of Mary Queen of Scots.	Head's Narrative.
Memoirs of Hannah More.	Dunlop's Drinking Usages.
Fraser's Travels on the Shores of the Caspian Sea.	Library of Romance, vols. 8 and 9.
Paul's Letters to his Kinsfolk.	Hamilton's Hindostan, vol. 2d.
Junius's Letters.	History of Genghis Khan.
Rennell's Geography of Herodotus.	Memoirs of Sebastian Cabot,
Jones's Institutes of Menu.	Chatham's Letters.
	Hannah More's Works, vol. 3d.
	Wondrous Tale of Alroy.

The Committee will hereafter consider and determine what steps should be taken to recover the prices of the books in question from the parties considered responsible for their loss. A new list will accordingly be prepared with an additional column showing the original cost of each missing or deficient work, and laid before the next monthly Meeting of the Committee.

Read letters from Messrs. Wm. H. Allen and Co., dated 17th and 19th January, 1848, the former enclosing a statement of their account with the Society for the past year, and the latter advising the despatch of periodicals and of books per Steamer.

XIV. *Resolved,*—That the receipt of Messrs. Allen and Co.'s letters be acknowledged, and that they be requested to send out the following books for the use of the Society:

Zoological Recreations, by W. J. Broderip, F. R. S.
The Stuart Papers.
Journal of an Expedition into the interior of Tropical Australia, by Colonel Sir T. Mitchell.
Modern Painters, by a Graduate of the University of Oxford.
The History of Auricular Confession, by Count C. P. de Lasteyne, translation by Charles Cooks, B. L.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following gentleman since the last monthly Meeting of the Committee, held on the 1st February, 1848.

Dr. J. Kennedy, No. 31..Rupees 2 0 0

XV. *Resolved,*—That this Memorandum be recorded.

(Signed) Walter Elliot, *Chairman.* (Signed) J. J. Losh, *Secy. M. L. S. &c.*

At an Annual General Meeting of the Madras Literary Society, and Auxiliary of the Royal Asiatic Society, held in the Society's Rooms, at the College, on Monday, the 27th March, 1848, *at half past* 10 *o'clock* A. M.

Present.

The Honorable D. Eliott, *Vice President,* in the Chair.
C. P. Brown, Esq.
Walter Elliot, Esq.
Dr. J. Kellie,
Sir H. C. Montgomery, Bart., and
Captain J. J. Losh, *Secretary.*

The Secretary submitted to the Meeting Messrs. Binny and Company's Account Current with the Society for 1847, showing a balance

in favor of the former on the 1st January, 1848, of Rups. 10-6 and, also, a general account of the receipts and disbursements of the Society in 1847, and its credits and liabilities, on the 1st January, 1848, showing a balance in its favor of Rups. 412-14-6.

I. *Resolved,*—That these accounts which have been passed by the Managing Committee, and appear satisfactory, be approved and passed.

Read Extract, Minutes of Consultation in the Public Department, dated 5th February, 1848, No. 129, and despatch therein recorded, from the Honorable the Court of Directors, dated 21st December, (No. 48 of) 1847. Read also letter to the address of the Secretary, from Walter Elliot, Esq., Chairman of the Committee of Management.

PUBLIC DEPARTMENT.

No. 48 of 1847.

Our Governor in Council Fort St. George.

Letters dated 11th March, No. 27, 1847, paras. 2 to 4—and 8th June, No. 12, 1847, paras. 5 to 7.

Madras Literary Society.

Para. 1. We approve of your having undertaken the charge of the Collections of the Madras Literary Society as contributions to the Central Museum, on the conditions proposed; viz., the restoration of the articles to the Society, if the Central Museum should be closed, and free access to it of the Members of the Society.

P. 5 to 7 of 8th June 1847. No. 12.

2. The object of these paragraphs is to obtain our sanction to the temporary outlay of 250 Rs. a month for an Establishment to prepare a list of the Manuscripts in the languages of the south of India which are now in the charge of the Madras Literary Society, and of which no complete catalogue exists,

No. 129.

Extract from the Minutes of Consultation, dated 5th February, 1848.

Resolved,—That a copy of this despatch be forwarded to the Committee of the Madras Literary Society with reference to communications from this department, dated 11th December, 1846, and 5th February, 1847, and that the sum of Rs. 250* a month be disbursed for a temporary establishment for the duty here indicated.

* Superintendent, Rups.	100
2 Pundits at 50 Rs. each,	100
English Writer,	50
Per month,...	250

The Committee will be pleased to furnish, for transmission to England a quarterly report of the nature required by the Hon'ble Court.

As it is desirable to have accurate information regarding the contents of the works in question, and as that can be obtained only through natives acquainted with the languages in which the books are written, we assent to your entertaining, as a temporary arrangement, the establishment you propose, requiring from the Superintendent either direct, or through such channel as you may deem most convenient, a quarterly report of the number of manuscripts examined and classed, copies of which reports you will transmit to us.

We are,
Your loving friends,
(Signed) H. St. G. Tucker,
,, J. L. Lushington,
&c. &c. &c.

London, 21*st Dec.* 1847.

(A true Copy and Extract.)

(Signed) H. C. Montgomery,
Officiating Chief Secy.

To
The Committee of the Madras Literary Society, and Auxiliary of the Royal Asiatic Society.

II. *Resolved,*—That the Managing Committee be requested to acknowledge the receipt of this communication, and to solicit the further instructions of Government regarding the disposal of the Museum, which still remains in the charge of the Society. Resolved, further, that the proceedings respecting the Indian books and manuscripts in the charge of the Society, detailed in the letter from the Chairman of the Managing Committee, appear highly satisfactory, and be approved of accordingly; and that the Committee be authorized to make such arrangements as they may consider requisite for carrying out the orders of the Honorable the Court of Directors and Government, in regard to the books and manuscripts.

To

The Secretary of the Literary Society.

Sir,

The Honorable Court of Directors having been pleased to sanction a temporary allowance not exceeding 250 Rupees per mensem for the examination of the Native MSS. now in the custody of the Society, as communicated to us in the Extract from the Minutes of Consultation of Government of the 5th February last, I think it desirable that the Committee should be made acquainted with what has been done since the date of our last report to Government under date 5th June, 1846.

In the 11th para. of that document the Sub-Committee promised a further report upon the same subject in which they proposed to attempt a more accurate classification of the works according to their subjects; being, in fact, the first step towards the preparation of a *catalogue raisonné*.

This object has been steadily, though slowly, prosecuted ever since, principally under my superintendence with the limited means at my disposal, consisting of the unemployed moonshees on the Establishment of the College, one of whom is specially attached to me as a Member of the College Board, and occasional aid rendered by the Canarese translator's Establishment, whenever it could be made available for the purpose.

By these means 1103 MSS. have been examined and their contents abstracted, being not quite half the number of those which required to be subjected to such scrutiny, as per accompanying tabular statement. Of the remainder the greater part of the Sanscrit volumes of the Mackenzie collection have already been catalogued by Dr. Wilson, and those in the vernacular dialects by the Rev. Mr. Taylor. It now remains for the Committee to determine how these various materials are to be amalgamated into one complete work, showing the character and contents of the whole collection, in such a way as to render the books easy of reference, and available for the purposes of literary research.

The plan proposed by the Sub-Committee was to procure the services of a young officer who had given his attention to the study of the vernacular dialects, and showed otherwise an aptitude and taste for such studies. Two young men were then available who seemed well qualified for the purpose, Lieutenant Frye of the 22d M. N. I. and Lieutenant C. D. Grant of the M. N. I., but both of these, it is feared, are beyond our reach. Unless we can obtain the services of such a qualified Superintendent, I would propose that the examination of the MSS. should be prosecuted as at present, without incurring much additional expense, until the whole have been abstracted. We could then take into consideration the best means of putting the whole into shape, which is rather a work of arrangement and order, than one requiring high lite-

rary qualifications. The whole should be sedulously overlooked by the Committee to see that the catalogue is prepared in such a form as will meet the wishes of the Honorable Court, and subserve the purposes of Oriental Scholars. The execution alone should be entrusted to the Superintendent, who should be required to submit all deviations from the prescribed plan to the Committee, and should, on no account, be allowed to introduce any alterations in conformity to his own ideas.

I am, &c.,

(Signed) W. E.

	Books in the Library.			Examined and abstracted.			To be examined.			Remarks.
	Cadjan.	Paper.	Total.	Cadjan.	Paper.	Total.	Cadjan.	Paper.	Total.	
Sanscrit,.......	805	534	1339	750	36	786	55	498	553	Of these 15 are writ-
Teloogoo,.... .	712	452	1164	312	0	312	400	452	852	ten in Canarese cha-
Canarese,......	0	22	22	0	0	0	0	22	22	racters and 5 in Ma-
Tamil,...	14	0	14	2	0	2	12	0	12	layalam, also 17 in
Malayalam,...	3	0	3	3	0	3	0	0	0	Nagari and 5 in
Burmah,... ...	21	0	21	0	0	0	21	0	21	Bengali. Total..42.
Total...	1555	1008	2563	1067	36	1103	488	972	1460	

	RS.	A.	P.
N. B.—Kripacharry the Pundit was employed from 15th October, 1847, to February, 1848, at 35 Rupees per month,..	157	8	0

Also a Moonshee was employed in examining the Teloogoo Books from 6th January, 1848.

25th February, 1848.

Read the following list of Donations of Books, &c. to the Society since the last Annual General Meeting.

List of Books, &c. presented to the Society since the last Annual General Meeting, held on the 25th February, 1847.

	Donors.
Dana's Two Years before the Mast, - - - - -	C. P. Brown, Esq.
Morrison's Chinese and English Dictionary, 4 vols, -	Lieut. G. N. Bredin, H. M. 94th Regt.
Observations made at the Magnetical and Meteorological Observatory at Bombay, April, Dec. 1845, - -	Bombay Government.
Horary Meteorological Observations made at the Honorable the East India Company's Magnetic Observatory at Madras by Captain S. O. E. Ludlow, in the interval 1841-1846, - - - - - - - -	Madras Government.
Astronomical Observations made at the Honorable the East India Company's Observatory at Madras, in the years 1843 to 1847, by T. G. Tayler, Esq. - -	Ditto.

	Donors.
Meteorological Observations made at the Meteorological Bungalow on Dodabetta 8640 feet above the level of the sea in the years 1847, 1848, under the direction of T. G. Taylor, Esq. - - - - - - -	Madras Government.
Catalogue of the Calcutta Public Library, - - -	The Curator of Calcutta Public Library.
Bibliographia Armeniaca; or an Introduction to the choice collection of Elementary, Classical, Religious and Miscellaneous works in the Armenian language, by Samuel Marcar, - - - - - - -	The Author.
General Observations on the Provinces annexed to the Russian Empire under the denomination of the Territory of Armenia. Translated from the French with notes—by Samuel Marcar, - - - - -	The Translator.
67 Volumes of German Works, - - - -	Mathematical and Physical Class of the Royal Academy of Bavaria.
Rudiments de la langue Hindoui, par M. Garcin de Tassy, - - - - - - - - -	The Author.
Several mineral specimens, including specimens of Newboldite, a new mineral described by Mr. Piddington,	Captain T. J. Newbold.

III. *Resolved,*—That the above mentioned books be placed in the Library for the use of Subscribers, and included in the next Catalogue, and the mineral specimens be added to the Museum; and that the donors who have been already thanked by the Managing Committee, are entitled to the acknowledgments of the Society.

Read list of twenty-four Members of the Society who have ceased to subscribe, left the Presidency, or died, and of thirty-one who have become Subscribers, since the last Annual General Meeting.

Ceased to Subscribe.		*Become Subscribers.*	
1 D. Pugh, Esq.	First Class.	1 Dr. J. Kellie,	First Class.
2 C. Sooboo Moodeliar,	do.	2 Dr. C. St. John,	do.
3 The Most Noble the Marquis of Tweeddale, K. T. and C. B.	do.	3 J. Goldingham, Esq.	do.
		4 R. B. Bell, Esq.	do.
		5 W. U. Arbuthnot, Esq.	do.
4 A. Robertson, Esq.	do.	6 D. Mackenzie, Esq.	do.
5 J. U. Ellis, Esq.	do.	7 Lieut. A. H. Hope,	do.
6 Col. W. Strahan,	do.	8 G. S. Hooper, Esq.	do.
7 Hon. H. Chamier, Esq.	do.	9 F. Lushington, Esq.	do.
8 J. Western, Esq.	do.	10 H. Corbett, Esq.	do.
9 R. B. Bell, Esq.	do.	11 J. H. Blair, Esq.	do.
10 Major Gen. Monteith, K. L. S.	do.	12 W. E. Underwood, Esq.	do.
11 W. Middlemass, Esq.	do.	13 C. V. Conniah Chetty,	Second Class.
12 D. Ross, Esq.	Second Class.	14 E. Maltby, Esq.	do.
13 Æ. R. McDonell, Esq.	do.	15 A. W. Phillips, Esq.	do.
14 J. R. Boyson, Esq.	do.	16 Cornet W. Sapte,	do.
15 Captain Ludlow,	do.	17 Lieut. J. P. Frye,	do.

Ceased to Subscribe.		*Become Subscribers.*		
16 Major J. T. Philpot,	Second Class.	18 Sir H. C. Montgomery, Bart.		2d Class.
17 Captain Seale,	Under Rule IV.	19 Capt. Seale, H.M. 94th,		Under Rule IV.
18 Lieut. J. S. Menzies,	do.	20 Lieut. H. H. Pratt,	do.	do.
19 Lieut. H. T. McCrea,	do.	21 Capt. L. Desborough,	do.	do.
20 Lieut. Col. L. W. Watson,	do.	22 Lieut. J. S. Menzies,	do.	do.
21 Lieut. A. Campbell,	do.	23 Lieut. H. T. McCrea,	do.	do.
22 Captain A. C. Meik,	do.	24 Lieut. A. Campbell,	do.	do.
23 Captain E. W. Snow,	First Class.	25 Capt. A. C. Meik,	do.	do.
24 Sir John Doveton, G. C. B.	do.	26 Lieut. H. Wahab,	do.	do.
		27 Lieut. Col. L. W. Watson,		do.
		28 Lieut. H. H. Macleod,		do.
		29 Lieut. Col. M. McNeill,		do.
		30 Major Williams, H. M. 4th,		do.
		31 Lieut. Genl. Sir G. H. F. Berkeley, K. C. B.		First Class.

IV. *Resolved*,—That these lists, which appear satisfactory, as showing that the number of Subscribers has increased since the last General Meeting, be recorded.

Read list of old bills for sums due to the Society which the Managing Committee consider irrecoverable, and, accordingly, with two exceptions, in which the debtors are still alive and in India, recommend should be cancelled, and struck out of the accounts as bad debts.

List of Old Bills to be Cancelled.

	BILLS.	RS.	A.	P.
C. J. Brown, Esq. dead, - - - - - - -	5	110	0	0
Rev. Mr. Webster, dead, - - - - - -	1	22	0	0
Captain A. Mackworth, - - - - - - -	4	101	0	0
Captain C. A. Kerr, dead, - - - - - -	4	88	0	0
Captain (now Major) Poole, - - - - - -	8	181	10	8
R. T. Porter, Esq. - - - - - - - - -	5	110	0	0
Captain Otter, returned to England, - - - -	3	66	0	0
Captain W. Walker, dead, - - - - - -	1	35	0	0
W. R. Smyth, Esq. - - - - - - - - -	2	29	5	4
Total...	33	743	0	0

V. *Resolved*,—That, as recommended by the Managing Committee, the bills in question be cancelled, and that the two debtors to the Society, who are still alive and in India, be again called upon for payment.

The Meeting proceeds, in conformity with Rule VII., to nominate members to form the General Committee of Management for the current year.

VI. *Resolved, unanimously*,—That Sir H. C. Montgomery, Bart., W. A. Morehead, Esq., Major R. Garstin, and T. Pycroft, Esq. be request-

ed to become Members of the Managing Committee, in addition to the undermentioned members of the present Committee.

WALTER ELLIOT, Esq. (*Chairman.*)
Major P. ANSTRUTHER, C. B.
C. P. BROWN, Esq.
Lieut. Colonel O. FELIX,
J. OUCHTERLONY, Esq.
Lieut. Colonel T. S. PRATT, C. B.
R. H. WILLIAMSON, Esq.

Proposed by Walter Elliot, Esq., seconded by Sir H. C. Montgomery, Bart., that the following Rule be established.

"Any Member of the Committee of management who shall, without satisfactory reasons assigned, absent himself from three successive monthly Meetings of the Committee, shall be held thereby to have ceased to belong to the Committee, which will, accordingly, proceed to supply his place in accordance with Rule X."

VII. *Resolved,*—That the above Rule be established.

Proposed by Walter Elliot, Esq., seconded by C. P. Brown, Esq., that steps be taken to render the Society's Library more available than it has hitherto been to the public at large, by throwing it open to a third class of Subscribers, each of whom will be allowed to carry out a single work at a time, on lodging a small deposit with the Librarian, on terms similar to those observed in the Public Libraries at Calcutta and the Cape of Good Hope.

VIII. *Resolved,*—That this Meeting approves of the proposed arrangement, and that the Committee of Management be authorized to adopt measures for carrying it into effect.

C. P. Brown, Esq., lays before the Meeting a letter from M. Müller, the Editor of the version of the Rig Veda, now in course of publication, under the patronage of the Honorable East India Company, requesting to be favored with copies of the Veda or its commentaries, and states that a copy of the Veda is amongst the works presented by him to Government, and now in charge of the Society.

IX. *Resolved,*—That, as it does not appear expedient that the work in question should be sent to England, the Managing Committee be authorized to apply for the permission of Government to make such arrangements as may appear advisable for supplying M. Müller with a copy of it.

X. *Resolved, unanimously,*—That the thanks of this Meeting be offered to the Honorable the Vice President for his conduct in the Chair.

(Signed) J. J. LOSH, *Secy. M. L. S. &c.*

(Signed) D. ELIOTT, *Vice President.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 4th April, 1848, at 7 o'clock P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Major P. ANSTRUTHER, C. B.
C. P. BROWN, Esq.
Sir H. C. MONTGOMERY, Bart.
J. OUCHTERLONY, Esq.
T. PYCROFT, Esq.
R. H. WILLIAMSON, Esq., and
Captain J. J. LOSH, *Secretary.*

Read list of books included in the Catalogue of the Society's Library, but which have been lost or destroyed, and most of which are required to be replaced, prepared in conformity with the 13th Resolution at the last monthly Meeting of the Committee, but not quite completed.

I. *Resolved,*—That Messrs. Allen and Co. be requested to send out the newest and cheapest good editions of such of the missing works in question, as the Committee, at their last Meeting, resolved should be replaced; and also, to adopt the necessary measures for obtaining from dealers in old and second-hand books, such separate volumes of books and numbers of periodicals as are required to supply deficiencies in the Library. The prices of the books and periodicals in question, as soon as ascertained, will be debited to the parties responsible for the deficiencies which they are to supply, and payment will be applied for accordingly. As, in most cases, the charges will not correspond with those originally incurred by the Society for the books and periodicals in question, the Committee do not consider it necessary that this list should be completed or recorded.

Read letters from Messrs. Pharoah and Co., and J. R. Logan, Esq., of Singapore, received with eight numbers of the Journal of the Indian Archipelago and Eastern Asia, presented to the Society by the latter gentleman.

ATHENÆUM LIBRARY, MADRAS, 30*th March*, 1848.

To

The Secretary to the Literary Society.

SIR,

In handing the accompanying note from J. R. Logan, Esq., of Singapore, we beg to wait on you with eight numbers of the Journal of the In-

dian Archipelago, viz., from the 3d to the last published, and shall feel thankful to be favored with an acknowledgment.

Mr. Logan has asked us to send the two first numbers likewise, but the supply thereof forwarded to us has been sold.

We are, Sir,
Your most obedient servants,
(Signed) PHAROAH AND Co.

To

The Secretary of the Literary Society,
Madras.

SIR,

May I beg the Society's acceptance of the back numbers of the Journal of the Indian Archipelago and Eastern Asia. They would have been regularly presented from the commencement if I had been aware that the Society still flourished.

Your most obedient servant,
(Signed) J. R. LOGAN.

SINGAPORE,
7th March, 1848.

II. *Resolved*,—That these numbers of the Journal of the Indian Archipelago and Eastern Asia be accepted, and that Mr. Logan be thanked, on behalf of the Society, for his present to it. The Committee observe that they had intended to subscribe to the periodical in question on account of the Society. The subject will be again taken into consideration as soon as the 1st and 2d numbers of the periodical are received, and it is ascertained whether Mr. Logan intends to supply the Society gratuitously with future numbers as published.

Read Memorandum of certain articles of stationery, &c. required by the persons employed at the cost of Government, to look after the Indian Books and Manuscripts at present in the Society's charge.

Memorandum of Stationery required annually for the use of the Native Library.
4 Towels for cleaning and dusting books,
Papers,
Pencils,
Quills,
Penknives,
Country Ink or Sage.

(Signed) సరూప్సింగు.
4th April, 1848.

III. *Resolved*,—That the Librarian be authorized to supply such of the articles in question as are absolutely requisite, keeping a separate account of the cost of them, (which will be laid before the next monthly Meeting) in order that it may eventually be defrayed by Government.

IV. *Resolved*,—That Messrs. Allen and Co. be requested to send out the following new books for the use of the Society:

Napier's Florentine History.
An Introduction to English Antiquities, by James Nicholson.
The Hakluyt Society's Edition of Hawkins' South Sea Voyage.
Italy Past and Present, by L. Mariotti.
The Birds of Jamaica, by P. H. Gosse Van Voorst.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a memorandum of the sums received on account of subscriptions to Nos. 30 and 31 of the Society's Journal, since the last Meeting, is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentlemen since the last monthly Meeting of the Committee held on the 11th March, 1848.

C. Whittingham, Esq., No. 30, - - - -	Rs.	2	0	0
J. Caldecott, Esq., Nos. 30 and 31, - - -	,,	4	0	0
	Rupees...	6	0	0

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 2d May, 1848, *at* 7 *o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Major P. ANSTRUTHER, C. B.
Lieut. Colonel O. FELIX,
Major R. GARSTIN,
Sir H. C. MONTGOMERY, Bart.
W. A. MOREHEAD, Esq.
Lieut. Colonel T. S. PRATT, C. B.
T. PYCROFT, Esq.
R. H. WILLIAMSON, Esq., and
Captain J. J. LOSH, *Secretary.*

The Secretary reports that the Right Honorable Sir H. Pottinger,

Bart., G. C. B., has become a Member of the Society of the first class, and, that, according to rule and practice, the Governor of Madras for the time being holds the Office of Patron of the Society.

I. *Resolved*,—That the Secretary be requested to write to the Private Secretary to the Right Honorable the Governor of Madras, requesting, in the name of the Committee of Management, that His Excellency will confer on the Society the honor of becoming its Patron.

With reference to the 2d Resolution at the last monthly Meeting, the Secretary states that he has ascertained from Messrs. Pharoah and Co. that J. R. Logan, Esq., intends to continue to supply the Society gratuitously with the numbers of the Journal of the Indian Archipelago and Eastern Asia as published.

II. *Resolved*,—That Mr. Logan be informed that the Committee have directed copies of Nos. 31 and 32 of the Literary Society's Journal to be transmitted to Singapore for his acceptance, and that a copy of each future number will be, in like manner, forwarded as published.

The Secretary states that, as there have been considerable changes in the Office-bearers, Committee of Management, and Subscribers, as well as several revisions of the rules, since the last Catalogue was printed in 1846, it appears desirable to have the usual number of copies of revised and corrected lists and rules printed, as soon as convenient, for distribution to the Subscribers; but as there are still upwards of 100 copies of the Catalogue in the Library, it does not seem necessary to print a new Catalogue at present.

III. *Resolved*,—That a revised and corrected copy of the lists in question and the rules of the Society be prepared and laid before the next monthly Meeting, with a statement of the probable cost of printing 250 copies for distribution to Subscribers.

A report on the Calcutta Public Library for 1847 and 1848.
A statement of facts relative to the transactions between the Writer and the late British Political Mission to the Court of Shoa in Abyssinia. By C. T. Beke, Esq., Ph. D. &c. &c.

Two pamphlets (as per margin) presented to the Society since the last Meeting are laid before the Meeting.

IV. *Resolved*,—That these pamphlets be laid on the Library table, and that the donors of them be thanked on the first convenient opportunity.

* Col. W. Strahan,...... Rs. 22
Asst. Surg. W. Middlemass,............. .. ,, 22
A. J. Arbuthnot, Esq.. ,, 22

Three unpaid bills for subscription for the first quarter of the present year due by Subscribers* who have returned to England are laid before the Meeting, and the Secretary re-

ports that it seems to have been usual on former similar occasions to cancel such bills.

V. *Resolved,*—That as it is understood that Colonel Strahan and Dr. Middlemass are not likely to return to India their bills be cancelled, according to former practice, but that Mr. Arbuthnot's bill be presented to him for payment on his return to Madras.

MEMO.

The undermentioned articles of Stationery have been supplied to the Native Librarians from time to time, at the expense of the Society during the last two years.

29 quires of brown paper, price......	Rs.	5	12	9
67 quills, „	„	1	15	0
Total Rupees..		7	11	9

With reference to the 3d Resolution at the last Meeting, a Memorandum showing the articles of stationery supplied to the Librarian of the Native (Government) Library within the last two years is laid before the Meeting.

VI. *Resolved,*—That, in future, applications from the Native Librarians for supplies of stationery be laid before the Committee before being complied with.

With reference to the 12th Resolution at the Meeting of the 11th March last, the Secretary reports that at the request of Lieut. Colonel Watkins, the number of the Society's Journal returned, under a misconception, by Captain C. J. Elphinstone, has been re-transmitted to him, and that he has paid for it.

VII. *Resolved,*—That the explanation afforded on behalf of Captain C. J. Elphinstone appears satisfactory.

VIII. *Resolved,*—That Messrs. Allen and Co. be requested to send out the following new books for the use of the Society.

Landor's Hellenees.

Lectures on the Physical Phenomena of Living Beings, by C. Matucca, translated by Pereira.

Indian Railways, by an old Indian Postmaster.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of subscriptions to Nos. 30 and 31, of the Society's Journal since the last Meeting is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following gentleman since the last monthly Meeting of the Committee, held on the 4th April, 1848.

C. Desormeaux, Esq., Nos. 30 and 31,....Rupees 1 0 0.

IX. *Resolved,*—That this Memorandum be recorded.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 6th June, 1848, *at* 7 *o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Lieut. Colonel O. FELIX,
Sir H. C. MONTGOMERY, Bart.
Lieut. Colonel T. S. PRATT, C. B.
T. PYCROFT, Esq., and

Captain J. J. LOSH, *Secretary.*

With reference to the 1st Resolution at the last monthly Meeting read letter from R. Woosnam, Esq., Private Secretary to the Right Honorable the Governor of Madras.

GOVERNMENT HOUSE, 5*th May*, 1848.

SIR,

I have the honor to acknowledge the receipt of your letter of yesterday's date, and in reply to it I am directed by the Right Honorable Sir Henry Pottinger to say that it will afford him great gratification to become the Patron of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

I remain, Sir,
Your most obedient and faithful servant,
(Signed) RICHARD WOOSNAM.

Captain J. J. LOSH,
Secretary to the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

I. *Resolved,*—That this letter be recorded, and that the name of the Right Honorable Sir Henry Pottinger, G. C. B., be entered in the revised list, about to be published, as Patron of the Society.

MEMO.

To Printing *300 copies Rules,&c. of the Madras Literary Society will make about 11 or 12 pages of 8vo.

	RS.	A.	P.
6 plain 8vo. pages of Burgeoise at Rs. 1-6-0........	8	4	0
5 plain 8vo. pages of Brevier at Rs. 1-10-0........	8	2	0
1 plain 8vo. page of Nonpareil....................	2	12	0
To 19 quires 3 sheets of French Foolscap paper at 4 Annas the quire........	4	12	6
To 4 quires 4 sheets colored Demi paper at 12 annas the quire..................	3	2	0
To stitching the above at 1 pie each..................	1	9	0
Rupees..	28	9	6

* 250 or 300 copies will form the same charge.

C. K. S. PRESS, 20*th May*, 1848.

In advertence to the 3d Resolution at the last monthly Meeting the Secretary states that, in consequence of the arrangement sanctioned by the 8th Resolution of the last Annual General Meeting, for throwing open the Society's Library to a third class of Subscribers not having been yet completed, it has been found impossible to prepare a complete and correct copy of the rules of the Society, and that the charge for printing 250 copies of the lists of Subscribers, &c. and rules will be about 29 Rupees, as per statement obtained from the Christian Knowledge Society's Press.

II. *Resolved*,—That the consideration of this subject be postponed until the next monthly Meeting of the Committee, before which it is probable that the arrangement in question will be completed.

MEMO.

The Society has for transmission the undermentioned three parcels, containing numbers of the Society's Journal, two to Calcutta and one to Singapore.

1 Parcel to the Secretary to the Delhi ArchæologicalSociety containing Journal Nos. 2, 3, 4, and 5. Care of Messrs. Ostell, Lepage and Co., Calcutta.

1 Parcel to the Public Library, Calcutta, containing Nos. 3, 4, and 5 of the Journal.

1 Parcel to J. R. Logan, Esq., Singapore, containing Nos. 31 and 32 of the Journal.

Read Memo. respecting numbers of the Society's Journal which are to be transmitted to the Delhi Archæological Society and the Public Library at Calcutta to complete the sets presented to these Institutions, and to J. R. Logan, Esq., of Singapore, in conformity with the 2d Resolution at the last monthly Meeting.

III. *Resolved*,—That the parcels in question be transmitted to Calcutta and Singapore by the next Steamer from Madras.

Read letter from Major M. Poole, 5th Regt. N. I., in reply to a demand made by the Secretary, in accordance with the 5th Resolution at the last Annual General Meeting, for payment of the sum of Rupees 181-10-8 due by him to the Society since the year 1834.

To

The Secretary of the Madras Literary Society.

SIR,

I beg to acknowledge the receipt of your letter of the 9th instant, and to state that being under the impression that some mistake exists has caused this delay in settling the account.

It is my intention to take an early opportunity to satisfy myself regarding the matter, and I trust soon to adjust the same.

Your obedient servant,

(Signed) M. POOLE.

10th May, 1848.

IV. *Resolved*,—That should Major Poole not adjust the demand in question within a reasonable time, he be again applied to for payment.

Read two letters applying for information respecting the Rules of the Society, and inquiring whether an Officer residing at Wallajahbad can be allowed to become a Subscriber to the Library.

To

The Secretary of the Literary Society,
Madras.

SIR,

It has been suggested to me that the Literary Society of Madras might supply the plan of a book club on certain conditions. I take the liberty of addressing you to make inquiries on the subject, viz., whether the Literary Society supplies the reading of books on the principle of most book clubs, and on what terms. My being perfectly unacquainted with the nature of the Literary Society of Madras, will, I trust, plead my excuse for troubling you with this question.

I remain,

Your most obedient servant,

(Signed) JAMES INNES.

WALLAJAHBAD,
15th May, 1848.

ST. THOMAS' MOUNT,
24th May, 1848.

To

The Secretary to the Madras Literary Society,
Madras.

SIR,

I shall be obliged by your informing me whether an Officer at present residing at Wallajahbad, 40 miles from Madras, can be allowed to become a Subscriber to the Madras Literary Society and if such is allowable, by your furnishing me with a copy of the conditions and regulations it would be necessary for him to abide by.

I remain, Sir,

Your obedient servant,

(Signed) E. F. FASKEN, Lieut.,
Madras Artillery.

V. *Resolved*,—That Dr. Innes and Lieut. Fasken be informed that, under the existing Rules of the Society (with copies of which they have been furnished by the Secretary) books cannot be forwarded from the Library to Wallajahbad, or any other out-station.

Read letter from Messrs. W. H. Allen and Co., dated 19th April, 1848, advising the dispatch of periodicals and books per Steamer.

VI. *Resolved*,—That the receipt of Messrs. Allen and Co.'s letter and of the periodicals and books alluded to, be acknowledged, and that they be requested to send out the following books for the use of the Society.

The Autobiography of Goëthe, translated by John Oxenford.
The Life and Adventures of Oliver Goldsmith, by John Foster.
The Life of the Great Lord Clive, by the Rev. G. R. Gleig.
The Three Days in February, 1848, by P. B. St. John.
Contributions to the Literature of the Fine Arts, by C. L. Eastlake, R. A.
The Romance of the Peerage, by G. L. Craik.
History of the Jesuits.
Life and Correspondence of Sir H. Lowe, edited by Sir H. Nicolas.

The Secretary states that an extra copy of the last complete and illustrated Paris edition of the Works* of Beranger has been sent out to him, by mistake, by Mr. J. M. Richardson, which if required for the Society may be had at the original price of £1-18-6, including charges for carriage.

* Œuvres completes de Beranger, 2 Tom. royal 8vo. sewed.

VII. *Resolved*,—That the work in question be purchased for the Society.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of Subscriptions to Nos. 30 and 31 of the Society's Journal since the last Meeting is laid on the table.

Memorandum.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following gentlemen since the last monthly Meeting of the Committee held on the 2d May, 1848.

Lieut. G. Reade, No. 31	Rupees	2	0	0
T. C. Jerdon, Esq. ,, ,,	,,	2	0	0
	Rupees..	4	0	0

VIII. *Resolved*,—That this Memorandum be recorded.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secretary, M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 4th July, 1848, *at* 7 *o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Major P. ANSTRUTHER, C. B.
C. P. BROWN, Esq.
Major R. GARSTIN.
Sir H. C. MONTGOMERY, Bart.
Lieut. Colonel T. S. PRATT, C. B.
T. PYCROFT, Esq., and
Captain J. J. LOSH, *Secretary.*

Read draft of proposed Rules for the establishment of a third class of Subscribers to the Library, in accordance with the 8th Resolution of the last Annual General Meeting, prepared by the Chairman of the Committee.

The Committee are of opinion that it would not be expedient to allow Subscribers of the 3d class to take out of the Library large and valuable works, such as the Encyclopedia Britannica, &c. &c. and that, therefore, a separate catalogue of the works issuable to the 3d class Subscribers should be prepared and printed as soon as possible, and that in the mean time, such books as are not to be taken out by Subscribers of the 3d class should be marked in each catalogue furnished to such Subscribers, and in the Librarian's catalogue for his guidance. The Committee are further of opinion that on a book being duly returned by a third class Subscriber at the expiration of the time allowed for its perusal, it may be again taken by him for a similar period, provided it has not been applied for by any other Subscriber. The Committee consider the proposed rules, modified as above stated, well adapted to answer their intended purpose, and approve of them accordingly.

3D CLASS.

The use of the stock books of the Library shall be open to persons, not Members of the Society, on the following conditions:

1st. Persons subscribing 1 Rupee monthly shall be denominated Subscribers of the third class, and shall be allowed to take out works of one volume, or if more than one, two volumes at a time.

2d. Every Subscriber of the third class before receiving books shall be required to lodge a deposit of not less than 20 Rupees with the Librarian one half in cash

and the other half in a promissory note ; and such deposit shall be applicable to the discharge of all claims by the Society upon such Subscriber.

3d. Applications for books to be made by Subscribers in person, or by a written order signed by such Subscriber, and sent by a person provided with a bag or box for the conveyance and security of the books, which shall also be returned with similar precaution.

4th. Subscribers of the third class shall be entitled to keep books for the following periods :

1 8vo. volume,	- - - - - -	a week,
1 4to. do.	- - - - - - -	2 weeks,
1 folio do.	- - - - - -	3 weeks,

exclusive of the day of delivery.

5th. On the expiration of the above periods the books to be returned to the Library by the party who took them, in failure of which he shall be subject, at the discretion of the Committee, to a fine not exceeding one anna a day, chargeable on his deposit for the time of detention in excess of the regulated period.

6th. Any 3d class Subscriber, failing to return a book within three months shall be required to provide another complete copy of the work, for which his deposit will be held responsible.

7th. Any book returned in a damaged state shall be reported to the Committee who shall determine the penalty to be exacted.

8th. Any Subscriber taking out a book in a damaged state and not, on returning it, giving notice of the same to the Librarian, shall be held accountable for it.

9th. Any Subscriber lending a book taken out by him shall incur a fine to be fixed by the Committee.

10th. Notice shall be given to any Subscriber of any fine or penalty incurred by him, and the amount, if not paid, shall be deducted from his deposit, and no book issued to him until the deposit be again completed.

11th. Subscriptions to be paid monthly to the Librarian by the parties themselves. No books will be issued to Subscribers in arrears.

12th. Subscribers desiring to withdraw shall receive back their deposit by and under an order of the Committee.

I. *Resolved*,—That the Rules in question, modified as above stated, be published with the revised Rules about to be printed, a draft of which is to be prepared and circulated as soon as possible.

Read letter from Messrs. W. H. Allen and Co., dated 19th May, 1848, advising the dispatch of periodicals and of books per Steamer.

II. *Resolved*,—That the receipt of Messrs. Allen and Co.'s letter, and of the periodicals and books alluded to, be acknowledged, and that they be requested to send out the following books for the use of the Society.

Historic Lands of England, by J. B. Burke.
History of De Bayard, set forth in English, by Edward C. Kindersly.
Narrative of the Expedition sent by Her Majesty's Government to the river Niger in 1841-42.

Recollections of Republican France from 1790 to 1801, by Dr. Millengen.
Personal Recollections of the late Daniel O'Connell, by W. J. O'Neil Daunt, Esq.

The Secretary reports, with reference to the 3d Resolution at the last monthly Meeting, that the parcels containing numbers of the Society's Journal for the Delhi Archæological Society, the Public Library at Calcutta, and J. R. Logan, Esq., of Singapore, were dispatched to their respective addresses by the *Precursor* Steamer on the 1st Instant, and that the Agent to the P. and O. S. N. Company, Mr. R. Franck, undertook to forward them free of any charge.

The Committee consider that Mr. Franck is entitled to their thanks, on behalf of the Literary Society, for his obliging conduct.

(Signed) Walter Elliot, *Chairman.* J. J. Losh, *Secretary M. L. S. &c.*

VI. *Meteorological Observations made at the Madras Magnetic Observatory, from January to June,* 1849.

	Mean monthly indication of the Barometer at the times of superior maximum and minimum pressure corrected to 32·0° 1.			Mean monthly temperature as deduced from the hourly observations, together with the mean monthly maximum and minimum temperature. 2.			Depth to which rain has fallen, and amount of water evaporated from a shallow cistern of water together with the relative humidity of the air. 3.			Direction of the wind in each month, as exhibited by the number of hours during which it has blown from the N. W. S. W. S. E. or N. E. 4.				Mean and extreme pressure of the wind as shown on a square foot of surface. 5.		Mean per centage of clouds covering the face of the sky during the day and night in each month. 6.		Mean monthly tension of vapour calculated by the monthly Means of dry & wet Thermometer at 30 inches Barometer standard. 7.
1849.	Maximum. *h. m.* 21. 41. P. M.	Minimum. *h. m.* 3. 41. P. M.	Difference.	Mean.	Max.	Mini.	Rain.	Evaporation.	Quantity of moisture or humidity.	N. W.	S. W.	S. E.	N. E.	Mean.	Extreme	Day.	Night	
	Ins.	Ins.	Ins.	°	°	°	Ins.	Ins.	Cents.	No.	No.	No.	No.	lbs.	lbs.	Cents.	Cents.	Inches.
January,	30·043	29·925	·118	77·2	83·2	71·3	2·504	6·814	·73	110	23	100	511	0·14	3·50	·41	·27	·671
February,	·004	·870	·134	78·6	86·0	71·1	0	7·867	·73	33	148	322	169	0·14	1·50	·20	·12	·698
March,	29·960	·826	·134	81·9	90·2	73·8	0	11·362	·72	40	209	465	30	0·21	1·75	·16	·08	·769
April,	·835	·707	·128	86·2	95·5	81·5	1·123	11·506	·73	25	261	426	8	0·37	2·35	·28	·23	·882
May,	·724	·604	·120	90·3	101·1	82·3	0·035	13·774	·63	43	393	303	5	0·30	2·20	·37	·31	·872
June,	·750	·617	·133	87·9	98·3	80·5	3·802	11·029	·64	107	439	159	15	0·42	4·20	·60	·71	·821

W. S. JACOB,
H. C. Astronomer.

MADRAS JOURNAL

OF

LITERATURE AND SCIENCE.

No. 36. *July—December*, 1849.

I. *On the Cultivation of Wheat in the Madras Presidency.*

Very little attention seems to have been bestowed upon the cultivation of wheat in the districts of the Madras Presidency, and the total quantity produced appears to be about six hundred garce. Its growth is limited to Mysore and the districts of Guntoor, Nellore, Bellary, Cuddapah, Kurnool, Salem, North Arcot, South Arcot, Coimbatore, and the Hyderabad and Nagpore territories.

In Rajahmundry there is no wheat grown. What is consumed there is brought down from the Deccan by the Binjaries who come to purchase salt.

If it were possible to have the advantages of water carriage on the Godavery, wheat might be imported from the states of Hyderabad and Berar. There are four sorts of wheat grown in the Deccan called yellow bunsee, dawoodkhanee, owradee, and segvalay, and each of these again comprehends three different kinds. The grain is, by no means good, and would not afford a profitable export to England. Considering, however, that no fresh seed has been introduced into the Deccan for, perhaps, centuries, and that the same land has continually been sown with the same description of seed, and that the grain has consequently become deteriorated, it must not be held as an

argument against the power of the lands to produce good and healthy wheat: the first essential to this result being the supply of fresh seed. It is grown in the provinces of Gundapoor, Bheer, Auckeed Puttam, Bathree, Punbunny, Nandair, and Gungakhair, through all of which the Godavery has its course. It is also grown in Balaghat and Payenghat, in Aurungabad, Purindah, and generally in all lands which bear the Rubbee crops, and the cultivation could be increased to any extent along both banks of the river, were a market opened for the produce. It can be produced at a cheap rate, and the Godavery may afford great facilities for its transport.

In Guntoor wheat is cultivated in only four villages in the Prettipaud Talook. The ordinary annual produce is about 50 candies or 2,000 bushels, and is mostly consumed in the district. Wheat crops being hazardous compared with other crops, the ryots are not inclined to extend its cultivation.

Nellore produces but a small quantity, varying from 6,800 lbs. to 2,400 lbs. per annum, grown in the talook of Ongole, not sufficient for the consumption of the district: the rest being brought down by the Binjaries.

In Bellary the total quantity of land fit for wheat cultivation is 14,600 acres; of which only 4,056 or 28 per cent. are under this tillage. The causes of this are

1st. The insufficiently remunerative profit procurable for this produce.

2d. The prevalence of a disease peculiar to this grain, which is generally attended with loss to the cultivator.

3d. The straw of wheat not being generally used as forage for cattle, and

4th. The greater expense incurred, and labour required, in preparing the soil, and tending this plant to its maturity, and time of harvesting compared with other produce. Wheat raised on a fertile dry soil requires repeated falls of rain (frequently not received) to attain maturity.

Two kinds of wheat are produced in this district *Salakee gothoomah*, and *Java gothoomah*. The former is better, and its flour darker in colour than the latter. The annual produce is estimated at 162 garce, all of which is consumed in the district, together with

293 garce imported from Dharwar. The ordinary bazar price is Rupees 165½ per garce, or about Rupees 1-1-2 per bushel, allowing 9,256½ lbs. to the garce, and 60 lbs. to the bushel. The cost of transport to Madras is on the average Rupees 145 per garce.

The greater part of the land of the Bellary Collectorate cultivated with wheat is black soil mixed with saline ingredients, or black soil of a loamy description. Ploughing is not required, but the land is harrowed from 4 to 8 times according to the ability of the cultivator, and the seed (with the husk) sown by means of the "gorray" which drops it in drills. The remainder (370 acres) is black and mixed soils irrigated by wells: ploughing always required, and the sowing is broad cast. The season for sowing is in September or October; and in 90 days from the time of sprouting (which is in 6 or 7 days) the produce is harvested. The height of crop varies from 18 to 24 inches. Lands in the beds of tanks yield the most remunerative produce, having the advantage of rain water remaining in them. Irrigated lands entail a far greater amount of labour, and expense of time and capital. The cost of conveying a garce of wheat to Madras by bandies would be Rupees 170, and on bullocks Rupees 120.

Cuddapah produces three different qualities of wheat. The first sort in dry black lands; the second in dry lands and in the beds of tanks, and the third in wet lands. The quantity of land under cultivation for wheat is 2,800 acres, producing about 341 garce. The average price at which these three sorts have been sold within the last five years is respectively Rupees 233—204, and 175,—or Rupees 1–8–2,—1–5–2 and 1–2–2 per bushel. The cost for conveyance of a garce to Madras varies from Rupees 96 to 120. The district is not generally favorable to the growth of wheat, but its culture might be greatly improved and extended in the Northern Talooks, in the rich black soils, which already produce wheat of a fair quality, were sufficient inducement held out to the ryots to cultivate this grain in preference to other descriptions of produce; but in the absence of roads to facilitate the transport it holds out no prospect of its becoming an article of export to England.

In Kurnool the poverty and want of enterprize of the people is an obstacle to the extension of wheat cultivation, as also the ex-

pense attending it, its liability to be injured by blight or attacks of insects, the difficulty of storing it, and preserving it from rot or decay unless placed in chunam or fuller's earth, both expensive methods. The total produce of the district for 1256 fusly was 26½ garce, and the price averaged from 213 to 263 Rupees, or Rupees 1-6-2 to 1-11-5 per bushel, the cost of conveyance to Madras being Rupees 140.

Salem produces wheat on the hills of the four Talooks,—Salem, Namcul, Ahtoor, and Tripatoor, in soil chiefly composed of red earth. The cultivators of it are Malialies, and the produce of fusly 1256 amounted to 52 garce. The average price is Rupees 310-15-0 per garce. There are two descriptions of wheat called potty codoomby and javey codoomby: the latter only being cultivated. The cost of conveyance to Madras is Rupees 46 for 2½ cundugums or 50 mercals or 88 Rupees per garce. A certain portion of the quantity produced has always been exported to Madras, Trichinopoly, and Coimbatore. It is doubtful whether larger quantities of it could be profitably cultivated for export, from the expense of carriage. The extent of land under this cultivation is 3,960 acres.

In North and South Arcot the cultivation is carried to an extremely small extent, and there appears no probability of its being extended.

The only part of the Madura district where wheat is cultivated is the Palany hills, and even there to an insignificant extent, the supply required having to be furnished from the Salem district. It is probable, that these hills would produce a considerable quantity of wheat, but the thinness of the population and the difficulty of the passes are great obstacles in the way of exportation.

Coimbatore produces a limited quantity of wheat of two kinds, one the product of the Neilgherries the other of the low country, both of inferior quality. According to the return furnished by the Principal Collector of Coimbatore the quantity raised in fusly 1256 was 4 garce, and its price Rupees 1-12-10 per bushel, but in Captain Ouchterlony's Memoir of the Neilgherries published in our last it will be seen that that gentleman calculates the quantity grown upon the Hills as 3,000 bushels of 68⅜ lbs. to the bushel, or

more than 22 garce. He also gives it as his opinion that these hills "are capable of furnishing for export to Europe from 4 to 500,000 quarters of wheat of a quality far superior to that which is at present raised and at a cost sufficiently low to admit of large profits being realized by the grower, even when the price is so low as 65 shillings the quarter." The Collector is however of opinion that this district can never be made a wheat growing one; his reasons for forming this opinion are however not stated.

The climate of Madras is unfavourable to its successful cultivation. It grows luxuriantly, and produces seed, in the gardens of the Horticultural Society, but only, when treated with care and attention: for in general a mere empty ear is formed. It is believed that the Shedvaroy Hills, having an elevation of 5,000 feet, and a temperature, during the months of cultivation, of from 52° to 68°, are better adapted for success in this cultivation. Large quantities are grown there for domestic consumption. Probably a much nearer limit may be found in the range of hills 88 miles N. N. W. from Madras, of which Combaconum Droog is the highest, being about 2,250 feet above the level of the sea. Wheat is one of the rubbee or late crops in the vallies of the Kishna and Tumbudra at an elevation of probably not more than 1,800 feet; the temperature varying from 45° to 80° in the cold weather. In the Caraccas lat. 10° 3′ wheat is successfully cultivated at an elevation of 1,800 feet; and in the Isle of France lat. 20°, where the temperature rises to 78° and 80° wheat ripens on the coast. If therefore no local causes act unfavourably, the experiment might be made with advantage on Combaconum Droog, the soil, it is said, being favourable. A register of the temperature of these hills would be sufficient to decide the question, as wheat can only be successfully cultivated under a mean temperature of 67° or 68°.

Captain Dobbs, Superintendent of the Chittle Droog division, forwarded to Dr. Wight two samples of wheat, the produce of one of his talooks. It was grown on the black cotton soil common in that part of Mysore. It is stated to be of very good quality but not nearly equal to English grown wheat. The samples were of two kinds, the "flinty" and "soft," the former being more highly charged with gluten than the latter.

Notes on the Influence exercised by Trees on Climate.

In 1847 the Court of Directors sent a despatch to the Supreme Government, requesting the attention of the authorities to the effect of trees on the climate and productiveness of a country or district. On receiving this communication the Madras Government directed a circular to their revenue officers requesting them to forward any of the required information in their power, and several valuable reports have accordingly been received in reply. Three of these having been placed at the disposal of the Literary Society, for publication in their Journal, the first inserted is a paper by Assistant Surgeon Balfour, whose attention having been directed to this subject for many years past, his own observations will be found interspersed with the remarks of different authors, the whole forming a summary of all that is known regarding this very important subject. Our thanks are due to Mr. Balfour for the valuable precis he has given and for the many well authenticated facts he has furnished, and although there is necessarily much in these notes that is speculative, and requiring further investigation, yet, with this paper before them, future inquirers will be able to prosecute their labours with all the exactness that a scientific inquiry of such vast importance to India, demands. That the subject will now be fully investigated there can be no doubt, for besides an interesting letter received from Surgeon Smith, a very important one has also been received from General Cullen, whose well known scientific character is sufficiently appreciated to ensure the attentive perusal of any remarks that proceed from his pen. General Cullen's observations and the report by Surgeon C. J. Smith of the Mysore Commission, likewise appear in this number of the Journal.

Eds.

REVENUE DEPARTMENT.

No. 981.

Extract from the Minutes of Consultation under date the 8th September, 1848.

Read the following letter from Assistant Surgeon Edward Balfour.

From Assistant Surgeon EDWARD BALFOUR, *Madras Army.*

To The Secretary to Government.

SIR,—In the *Madras Spectator* of the 13th Instant it is mentioned that a despatch from the Court of Directors had reached the Supreme Government and been communicated to the Government of Madras on the subject of the effect produced by the presence of trees, whether as natural wood or the result of arboriculture, upon the climate and productiveness of any country, but more especially of India.

2d. A remark in one of Dr. Priestly's writings had directed my attention to the influence of trees on the health of man, and in the course of my inquiries, some years ago, I think in 1840, I arranged a few notes which I had collected on a collateral subject, viz.: the influence of trees in inducing rain and preserving moisture.

3d. These notes were published as an editorial article, to which the Editor prefixed the following paragraph.

" The following precis on the value and advantages of trees, their causing rain to fall in the districts where they grow, &c. will no doubt be read with pleasure by those who take an interest in the agricultural prosperity of India. The subject is one of great and general interest in any country, but, more particularly so in a country like this, where irrigation is of such paramount importance, involving the comfort and even existence of millions of our fellow creatures."

4th. This commendatory paragraph from the scientific and learned Editor makes me hope, that, at this time, when information is sought for, these notes may be accepted by the Government and may be deemed not unworthy of being added, or of forming a preamble to the information which they may be able to collect from other servants of this presidency.

I have the honor to be, &c.

KURNOOL, 31*st March*, 1848.

EDWARD BALFOUR, Asst. Surgn.
Madras Army.

II. *Notes on the Influence exercised by Trees in inducing Rain and preserving Moisture : arranged by Assistant Surgeon* Edward Balfour, *Madras Army.*

With the exception of a few localities in Southern India the whole country seems destitute of trees. Whether they have disappeared under the hands of man while none were planted to supply their places, or whether they never existed, nothing so much strikes the attention as their general scarcity.

Having passed over a large part of the peninsula this bareness reminded me of the great influence that trees are believed to exercise on the composition of the atmosphere and on the quantity of water that falls on the earth's surface, and impressed with the belief that no small benefit would accrue to the country, and to the Government, were trees planted in particular localities, along roads and on lands which from their height or other causes cannot be brought under cultivation, I thought it might be useful to arrange the meteorological facts bearing on this point that have been recorded by different observers ; for if a candid examination of these facts lead us to acknowledge their correctness, we cannot but look upon the cultivation of trees as of vital importance in such a country as India, where, under a tropical sun, the atmosphere is so likely to become loaded with miasmata and the fertility of the land is so much dependent on the supply of water.

Aware of the great falls of rain, which in several parts of India amount to 120 inches during the year, it might at first sight appear inexplicable to us when informed of the very limited quantity that other places receive ; and, amongst others, " that less rain falls at Bellary than at any other place in Southern India, for during the year 1838 only 11¼ inches fell." But our surprise diminishes on learning " that towards the centre of the Ceded Districts the surface of the plain presents a monotonous and almost treeless aspect bounded by the horizon, and unbroken save by a few rocky elevations that stand forth abruptly from the sheet of black soil like rocks from the ocean. The country from Bellary to Tarputtry and from Pennacoondah, Ghooty and Adoni to the Kistnah is much of a similar nature. Sir Thomas Munro might

well observe that these districts are more destitute of trees than any part of Scotland he ever saw, and that the traveller scarcely meets with one in fifty miles and no where with a clump of fifty.* In Bellary the heat and glare are excessive.

Incidental remarks are met with in the writings of many authors showing how closely, from their observations, the purity, humidity and temperature of the atmosphere, and the supply of water on the earth's surface depend on the foliage of trees; and, indeed, I would have hesitated to have thrown these few notes together were the facts less numerous than we find them, or in any way doubtful, but we can form from many of them no other conclusion than that the abundant or scanty supply of rain depends on the number or scarcity of trees, and that the quantity of rain which falls alters as the trees are diminished or increased.

All who have travelled over a bare sandy tract in a tropical country and breathed the dry irritating air lying over it must remember the great relief experienced on gaining the shade of a clump of trees or even of a solitary tree, and it is easy for such travellers to understand the beneficial effect that the cooler air, there, must exert on the neighbouring vegetation.

Alluding to the unhealthiness of Hong Kong, Fortune, in his "Wanderings"† remarks that his own observations had led him to the following conclusions. Much of the sickness and mortality doubtless proceeded from the imperfect construction and dampness of the houses in which our people were obliged to live when the colony was first formed, and a great deal may be also attributed to the fierce and burning rays of the Hong Kong sun. All the travellers in the East with whom I had any conversation on the subject agreed that there was a fierceness and oppressiveness in the sun's rays, here, which they never experienced in any other parts of the tropics, even under the line; I have no doubt that this is caused by the want of luxuriant vegetation and the consequent reflection of the sun's rays. The bare and barren rocks and soil reflect every ray that strikes them; there are no trees or bushes to afford shade or to decompose the carbonic acid and ren-

* Captain Newbold in Madras Journal of Literature and Science, No. 24, p. 122.

† Fortune's Wanderings in China, 1847, p. 26.

der it fit for the respiration of man, and thus the air wants that peculiar softness which makes it so equable even in hot tropical climates.

If these are the principal causes of the mortality in our new colony the remedy will of course be apparent to every one. Already a great improvement has taken place in the houses of the merchants and in the barracks of the soldiers, and the results have been most satisfactory. But the colonists must not stop in this stage of their improvements. Let the Governor and the inhabitants use every means in their power to clothe the hill sides in and around the town with a healthy vegetation: let them plant trees and shrubs by the road sides, in gardens and in every place available for such purposes, and, then, I have no doubt, that Victoria will be quite as healthy as Macao. No one can approve of the selection of Hong Kong as a British settlement, but that part of the business being irremediable we must make the most of our bargain."

But perhaps no one, more beautifully than Humboldt, describes the arid dryness which the aspect of a tropical country presents when destitute of vegetation. After a descent of 1,000 feet from the valleys of Aragua had brought the travellers towards the Oronoko they "entered the basin of the Llanos in the Mesa de Paja in the 9th degree of latitude. The sun was almost at the zenith; the earth wherever it appeared sterile and destitute of vegetation was at the temperature of 48° or 50°. Not a breath of air was felt, yet, in the midst of this apparent calm, whirls of dust incessantly arose. All around us, says Humboldt, the plains seemed to ascend toward the sky and that vast and profound solitude appeared to our eyes like an ocean covered with sea-weeds. The earth there was confounded with the sky, through the dry fog and strata of vapour, the trunks of palm trees were seen from afar; stripped of their foliage and their verdant summits, these trunks appeared like the masts of a ship discovered at the horizon.

There is something awful but sad and gloomy in the uniform aspect of these steppes. Every thing seems motionless; scarcely does a small cloud as it passes across the zenith and announces the approach of the rainy season, sometimes cast its shadow on

the Savannah. I know not whether the first aspect of the Llanos excites less astonishment than that of the chain of the Andes. It is impossible to cross these burning plains without inquiring whether they have always been in the same state: or whether they have been stripped of their vegetation by some revolution of nature. The natives believe that the palmares and the chaparales, (the little groves of palm trees and rhopala) were more frequent and more extensive before the arrival of the Spaniards. Since the Llanos have been inhabited and peopled with cattle, become wild, the Savannah is often set on fire to meliorate the pasturage, and groups of scattered trees beneath the shade of which vegetation enjoyed a protection from the scorching rays of the sun, are accidentally destroyed.*

St. Pierre tries to explain the mode in which trees temper the heat of tropical countries. One day in summer, he says, about the hour of two in the afternoon, being about to cross the forest of Ivry, I observed some shepherds with their flocks, who kept at a distance from it, reclining under the shade of the trees scattered over the country. I asked why they did not go into the forest, to shelter themselves and their flocks from the heat of the sun. They told me it was then too hot there and that they never drove their sheep thither but in the morning and evening. Being desirous, however, of traversing in broad day, the forest in which Henry IV. had hunted and of arriving betimes at Anet to view the country residence of Henry II. and the tomb of his mistress, Diana de Poictiers, I engaged a boy belonging to one of the shepherds to accompany me as a guide, which was a very easy matter to him as the road to Anet crosses the forest in a straight line and it is so little frequented that I found it covered in many places with grass and strawberry plants. I felt all the time I was walking a suffocating heat and much more intense than that experienced in the open country. I did not begin to breathe freely till I was quite clear of the forest and had proceeded more than three musket shots from its skirts.

I have since reflected on what the shepherds told me concerning the heat of the wood, and, on my own experience of the truth

* Personal Narrative, vol. iv., p. 291, et sequent.

of their information, and I have, in fact, remarked, that in spring, all the plants are more forward in the vicinity of woods and that violets are found in flower on their borders much earlier than in the open plain or on the naked hill. The forests, therefore, protect the ground from the cold in the north, but what is not a little wonderful, they shelter it from the heat in warm climates. These two opposite effects proceed only from the different forms and dispositions of their foliage. In the north the leaves of the pine, the larch, the fir, the cedar, and the juniper are slender, glossy and varnished; from their smallness, their polish, and the variety of their directions they reflect the heat around them in a thousand ways producing nearly the same effect as the hair of the animals of the north whose furs are warmer in proportion as their hair is more fine and glossy. Besides, the leaves of several species, as the fir and the birch, are suspended perpendicularly from their branches by long moveable stalks, so that with the least breath of wind, they reflect around them the rays of the sun, like mirrors. In the south, on the contrary, the palm, the talipot, the cocoa and the banana bear large leaves which on the side towards the ground are rather dull than glossy, and which extending horizontally, throw a broad shade beneath them, without any reflection of heat; I admit, nevertheless, that the clearing away of forests dispels the cold arising from humidity, but it increases the dry and piercing cold of the north, as experience has proved on the lofty mountains of Norway which were formerly cultivated, but are now uninhabitable because they have been totally stripped of their woods. This clearing of the ground likewise increases the heat in warm countries, as I have observed in the Isle of France on several hills, which, since all the trees have been destroyed, are become so dry as to be at present incapable of cultivation. The grass which grows on them during the rainy seasons, is in a short time burned by the sun. What is still worse, in consequence of the aridity of these hills a great number of streams are dried up: for trees planted on eminences attract the humidity of the air and fix it there, as we shall see in the study that treats of plants. Besides, by destroying the trees which are on high grounds, the vallies are deprived of their natural manures, and the plains of the skreens which shelter them from the high winds. These are in some

places so destructive to cultivation, that nothing can be made to grow upon them. It is to this cause that I ascribe the sterility of the heaths of Brittany. In vain have attempts been made to restore them to their former fertility, they will never succeed, unless we begin with restoring to them their shelter and their temperature by replanting their forests.*

This effect of trees in mitigating the intensity of tropical heat has also been alluded to by the present superintendent of forests in our western presidency, who mentions that in the southern districts of Guzerat the vicinity of the sea and the proximity of the mountain tracts covered with jungle tend to render the climate more mild and the temperature throughout the year, more equable, than is the case in the other parts of the province. Farther inland and in the immediate vicinity of the hills the heat is greater, and in both situations the humid and loaded atmosphere in the S. W. monsoon, is often painfully felt particularly at night. In the whole of this district rain falls in greater quantities than to the northward; in the jungle districts to the east, the supply of rain is said never to fail in the driest of seasons and it often falls there when none is apparent in the more open districts.

It is in such tracts as these that rivers rise, for from the number, height, and comparative proximity of the hills, to the southward of the Taptee, we might a priori suppose that the supply of water in that district would be abundant : and such is actually the case as we find in a breadth of 50 miles, eight rivers, all containing water throughout the year. Reasoning from these facts we may also predicate the sort of country in which these rivers have their origin, viz., under-lying hilly tracts abounding in rich soil, highly retentive of moisture and rendered still more so by luxuriant jungle.†

An instance of the quantity of rain increasing from trees being planted is mentioned in a work, very recently published in St. Helena, in which it is recorded that the quantity of rain which falls on that island has greatly increased within the last fifty years. The writer, after remarking that the past year (1847) may be considered a good one for the farm and garden, notwith-

* St. Pierre's Studies of Nature, vol. i., p. 223, ed. 1846.

† Surgeon Gibson in Tr. Bomb. Med. and Phys. Soc. Journal, p. 37 and p. 4.

standing the severity and length of the winter, thus continues; indeed in some parts of the island, the crops in particular have been remarkably good, having had plenty of rain at the proper season. By comparing with each other the quantities of rain which have fallen during the last seven years, it will be seen how greatly the amount varies from year to year. Many years must therefore elapse before sufficient data can be obtained from which to deduce a correct average of the annual amount. The quantity is perhaps double of what it was in the beginning of the present century. The cause of this increase is doubtless the plantations of trees which have been formed since that period on the high grounds. These plantations appear to have performed another piece of good service to the island. Formerly heavy floods caused by sudden torrents of rain, were almost periodical and often very destructive. For the last nine or ten years none have occurred. If the cause of these rains was electrical disturbance, the trees may, by their conducting powers, have controlled the tendency.*

If possessed of the foregoing information, alone, doubts might arise as to whether the extent of vegetation in such countries were not rather the consequence than the cause of the abundance of water, but the observations of other scientific men support the belief that a mutual reaction goes on between these two physical agents, and that the presence of trees greatly adds to the supply of water and feeds the running streams; and that so soon as man, to supply his wants, has thinned or removed the trees which clothe the hill sides of the district he inhabits, the rain diminishes or rapidly runs off, its rivers dry up, and the previous fertility of its lands completely disappears. As an instance of the consequence of the hill sides being denuded, an intelligent officer has stated that when he first went to Dapoolie, the hills were clothed with trees and shrubs; they now show nothing but bare rock and earth black and red. The climate is, now, considerably hotter and drier, and streams which then ran in May are now dried up in December.†

Humboldt after leaving the town of Caraccas remarks that ma-

* St. Helena Almanac, 1848, p. 5.

† Surgeon Duncan in *Bombay Times*, 1839.

ny of the mountains of that name enter the region of the clouds, but the strata of primitive rocks dip at an angle of 70° or 80° and generally toward the north-west. In the interior of the province we meet with spaces of land two or three leagues square, quite destitute of springs. The sugar cane, indigo and coffee can grow only in places where running waters can be made to supply the artificial irrigations necessary during very dry weather. The first colonists very imprudently destroyed the forests. Evaporation is enormous on stony soil surrounded with rocks that radiate heat on every side. In the eighth and tenth degree of latitude, in regions where the clouds do not glide along the soil, many trees are stripped of their leaves in the months of January and February, not on account of the sinking of the temperature as in Europe, but because the air at this season, the farthest from that of rains, has nearly attained its maximum of dryness. The plants with very tough and glossy leaves alone resist this absence of humidity. Beneath the fine sky of the tropics the traveller is struck with the aspect, almost hibernal, of the country: but the freshest verdure again appears, when he has reached the banks of the Oronoko where another climate prevails, and the great forests preserve by their shade, a certain quantity of moisture in the soil which they shelter from the devouring ardour of the sun.*

By felling the trees, that cover the tops and sides of the mountains, men in every climate prepare at once two calamities for future generations; the want of fuel and a scarcity of water. Trees by the nature of their perspiration and the radiation from their leaves in a sky without clouds, surround themselves with an atmosphere constantly cold and misty. They affect the copiousness of springs, not, as was long believed by a peculiar attraction for the vapors diffused through the air, but, because, by sheltering the soil from the direct action of the sun they diminish the evaporation of the water produced by rain. When forests are destroyed, as they are every where in America by the European planters with an imprudent precipitation, the springs are entirely dried up or become less abundant. The beds of the rivers remaining dry during a part of the year, are converted into torrents whenever great rains fall on the heights. The sward and moss disappear-

* Personal Narrative, vol. iv., p. 62.

ing with the brushwood from the sides of the mountains, the waters falling in rain are no longer impeded in their course; and instead of slowly augmenting the level of the rivers by progressive filtration, they furrow during heavy showers the sides of the hills, bear down the loosened soil, and form those sudden inundations that devastate the country. Hence it results that the destruction of forests, the want of permanent springs, and the existence of torrents, are three phenomena closely connected together.*

In the collectorate comprizing the South Conkan, under Bombay, since this tract has been denuded of forest as it now has, from the pressure of population, to a great extent been, all the inhabitants concur in asserting that the springs have left the uplands, that the climate has become greatly drier, the seasons more uncertain and the land less fertile. I believe that this can be confirmed by the testimony of the late Collector Mr. Elphinstone, but indeed it is most apparent to a person travelling along that line of country, as I have just now been doing, mainly with the intention of remarking changes which have taken place in the interval of fifteen years, which period of time has elapsed since I visited that line of country before; I have also understood that effects of a similar kind have been experienced at the Neilgherry Hills. A change of climate similar to that, now, under contemplation is by no means limited in extent to the mere district in which the clearing has taken place, but its influence extends far inland. Take for example all the southern and western portion of the Dharwar Zillah. This fertile country abounds in moisture in so much that it has been, (though rather inaptly I think) compared to the valley of the Mississippi: at all events American upland cotton grows there which it will hardly do in other parts of the Bombay Presidency. I think it is not too much to say that much of this moisture depends on the wooded country forming its western border, and that with the complete removal of this the climate would greatly change. My own opinion is that in the Bombay Presidency some cause of this kind has had a great share in producing that irregularity of the rainy season which has of late years been so much complained

* Personal Narrative, vol. iv., p. 143.

of, as to diminished fertility of the soil from the removal of belts of wooded country; the rationale of this is most evident.*

The climate of Rio de Janiero has been very much modified by the clearing away of the forests in the neighbourhood. Previous to this the seasons could scarcely be divided into wet and dry as they are at present. Then rain fell nearly all the year round, and thunder storms were not only more frequent but more violent. So much has the moisture been reduced that the supply of water for the city has been considerably diminished, and the Government has in consequence forbidden the further destruction of the forests." Gardner's Travels in Brazils.

Another author remarks that the whole of the eastern front of the range (of mountains in Penang) has within a few years been denuded of its forests, and representations have been often made to the local authorities at Penang, urging the necessity of reserving the jungles, on the summits and higher slopes, but hitherto without effect. * * * But climate concerns the whole community and its protection from injury is one of the duties of Government. In Germany and France there are special laws and departments for the preservation and extension of forests.

It is not necessary to cite Humboldt or Boussingault to prove the great influence in tropical regions of forests, and, especially, of mountain forests, in attracting and condensing clouds, diminishing local temperature and increasing humidity. But if the forests had no other effect than to protect the clay soil of the mountains from the action of the sun's rays this alone ought to be sufficient to ensure their careful preservation. It is in this soil that the waters which supply all the streams of the island, and which percolate downward to the lower lands, are enclosed. These mountains are in fact great natural reservoirs, elevated in mid air and exposing the most extended surfaces possible, which are covered to a small depth with a sponge of porous decomposed rock for the absorption and retention of water. In ordinary seasons, when there is a considerable fall of rain, the importance of preventing the contents of these reservoirs from being dissipated may not be so obvious. But it may now be considered as a well established fact that the eastern Archipelago is subject to periodical droughts, although the

* Report from Dr. Gibson, dated 9th March, 1846.

laws of their recurrence are not yet ascertained. That such droughts, will again happen and are in fact in the settled course of nature admits of no question.

Nature when left to herself provides a compensatory influence in the dense leafy forests but if these are consigned to destruction every successive drought will prove more baneful than the preceding. Unless Government will reserve at least the steeper mountain tracts which are not adapted for permanent culture there is nothing visionary in the apprehension, for it has been realized in other localities, that in some prolonged drought after the naked sides of the hills have been exposed for a few weeks to the direct heat of the sun every stream in the island will be dried up and universal aridity ensue. The great extent to which the plain of the mainland of Penang has been shorn of its forests, would of itself produce an urgent necessity for a stop being at once put to a war with nature, which must entail severe calamities on the future. In those mountains in Greece which have been deprived of their forests the springs have disappeared. In other parts of the globe the same consequence has followed. The sultry atmosphere and dreadful droughts of the Cape de Verde Islands are owing to the destruction of the forests. In large districts in India climate and vegetation have rapidly deteriorated from a similar cause, and the Government having become fully impressed with the necessity of respecting the stubborn facts of nature every means have been used to arrest and remedy the mischief. Forests which had been so easily and thoughtlessly cut down have at great cost been restored.*

The above remarks having been obtained from the writings of men whose lives have been devoted to the study of nature and her works, and the facts adduced having been drawn from the greater portion of our globe, it appears impossible that any one could rise from their perusal without acknowledging that there is a general belief entertained that it is to the abundance or scarcity of trees to which we must attribute the copious or scanty supply of rain, and the tempering, in the tropics, of the fierceness of the solar rays. While this general belief, therefore, must be acknowledged, and the fact itself, perhaps, admitted, it may, nevertheless, be as

* Journal of the Indian Archipelago, vol. ii. p. 534.

yet impossible to explain the mode in which trees and forests thus exercise their influence. From the writings of the authors above quoted it would seem as if several agencies were at work, and that independent of the supposed electric action which the mountain forests give rise to and of the attracting and condensing apparatus which their leaves are likened to, they produce a spongy tenacious under-soil which they protect from the drying effect of the winds and sun's rays, and by this means cause the rain that falls to trickle slowly to the lower lands and keep up a constant supply of water in the streams; and it will have been evident also that the trees which clothe the mountain summits are regarded by other authors, as a vast condensing apparatus placed by nature on the elevated parts of the earth to distil the waters of the clouds which so constantly enshroud their heights. While we are as yet only learning the laws that regulate the development of electricity, and its action on the surrounding atmosphere we know how great an influence it exercises on vegetation, and it is not impossible that mountain forests will ultimately be proved to be great electric forces placed by nature for the purpose of promoting the fall of rain. The most agreeable of the writers on this subject is St. Pierre who traces in every forest, tree, and shrub, and in every leaf and branch evidence of wise and beneficent design, which he beautifully alludes to when describing "the elementary harmonies of plants with the water and the air by means of their leaves and of their fruits."*

When the author of nature resolved to crown with vegetables even the highest pinnacles of the earth, he first adapted the chains of the mountains to the basins of the seas, which were to supply them with vapors; to the courses of the winds which were to waft them thither, and to the different aspects of the sun from which they were to receive warmth. As soon as these harmonies were established between the elements, the clouds ascended from the ocean and dispersed over the most remote parts of the continents. They there diffused themselves in a thousand different forms, in fogs, in dews, in rains, in snows, in frosts. They distilled from the upper regions of the atmosphere in manners equally various; some in a calm air, like our spring showers, fell in perpen-

* St. Pierre, Studies of Nature. London, 1846, vol. ii p. 23.

dicular drops, as if they had been poured through a sieve; others driven by violent winds, were hurled horizontally against the sides of the hills: others descended in torrents, like those which, nine months in the year inundate the island of Gorgona, situated in the heart of the torrid zone in the burning gulf of Panama. Some piled themselves in mountains of snow on the inaccessible summits of the Andes to cool by their waters the continent of South America and by their frigid atmosphere the vast Pacific Ocean. Lastly, mighty rivers flowed through regions in which it never rains and the Nile watered the plains of Egypt.

God then said "Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself upon the earth." At the words of the Almighty the vegetables appeared with organs fitted to collect the blessings of heaven. The elm arose on the mountains that skirt the Tanais covered with leaves in the form of a tongue: the tufted box issued from the brow of the alps; and the thorny caper tree from the rocks of Africa, with leaves scooped out into spoons. The pines of the sandy mountains of Norway attracted the vapors floating in the air with their taper foliage, arranged like a hair pencil: the verbascum extended its broad leaves over the parched sands; and the fern presented on the hills, its fan shaped foliage to the rainy and horizontal winds. A multitude of other plants from the bosom of the rock, from beds of flint, nāy even from marble incrustations, received the waters of heaven in cornets, in cups, in cruets. From the cedar of Lebanon to the violet that skirts the grove there was not one but what presented its ample bowl, or its diminutive cup, conformably to its necessities or its situation.

This adaptation of the leaves of the plants of elevated situations to receive the rain, is varied without end, but their character is in general perceptible not only in their concave forms, but likewise in a small hollow channel on the stalk by which they adhere to the branches. It is somewhat similar to that which nature has traced on the upper lip of man to receive the humours which descend from the brain. It may be observed in particular on the leaves of thistles, which delight in dry and sandy situations. They have besides collateral awnings to prevent the loss of any portion

of the water that falls from heaven; plants which grow in very hot and very dry situations sometimes have the entire stem and leaf transformed into a channel; such is the aloe of the island of Socotora at the entrance of the Red Sea or the prickly taper of the torrid zone. The aqueduct of the former is horizontal, and that of the latter perpendicular.

What has prevented botanists from remarking the relations that exist between the leaves of plants and the waters by which they are refreshed is that they see them every where nearly of the same form, in the vallies as on the eminences: but though the mountain plants exhibit foliage of every species of configuration it may be easily perceived from their aggregation in the form of hair pencils or of fans, from the contraction of the leaves or other equivalent marks, but principally from the aqueduct which I have just mentioned, that they are intended to receive the rain water. This aqueduct is traced on the stalk of the smallest leaves of mountain plants; it is by means of it that nature has rendered even the forms of aquatic plants susceptible of vegetation in the most parched situations. The reed for example, which is only a round full pipe that grows by the water-side, appears incapable of collecting any humidity in the air though it is well adapted to elevated situations by its capillacious form which like that of gramineous plants, presents nothing which the wind can lay hold of. In fact if you examine the different species of the rush that clothe the mountains in various parts of the world, such as that called *icho*, on the lofty mountains of Peru, which is the only vegetable that grows on some parts of them, and those that thrive in our climates in parched sands or on eminences, you would, at first sight, believe them to be similar to the rush of the marshes: but a little attention will enable you to observe, not without astonishment, that they are hollowed into a gutter throughout their whole length. Like other rushes, they are convex on one side: but they differ from them essentially in being concave on the other. By this character I discovered the spart, which is a rush of the mountains of Spain and is now employed at Paris to make cordage for draw wells.

The leaves of many plants, even in the plains, assume on their first appearance this form of a gutter or spoon, as those of the

violet and of most gramineous plants. In the spring you may perceive the young tufts of the latter raising themselves up towards heaven like claws to catch the drops, especially when it begins to rain: but most of the plants of the plains lose the gutter as they expand. It was given them only for the season necessary to their growth. It is permanent only in the plants of the mountains. It is scooped out as I have observed on the stalks of leaves, and in trees conducts the rain water from the leaf to the branch; the branch by the obliquity of its position conveys it to the trunk whence it descends to the root by a series of consequent dispositions. If you pour water gently over those leaves of a mountain shrub which are the most remote from its stem, you will observe it run off by the track which I have indicated and not a single drop will fall to the ground. I had the curiosity to measure in some mountain plants the inclination formed by their branches with their stems and I found in a dozen different species, as in the fern, the thuia, and others, an angle of about thirty degrees. It is exceedingly remarkable that this degree of incidence is the same as that formed in a horizontal plane by the course of many small rivers and rivulets, with the streams into which they discharge themselves as may be ascertained upon the maps. This degree of incidence seems to be the most favorable to the efflux of various fluids which direct themselves towards a single line. The same wisdom has regulated the level of branches in trees and the course of rivulets in plains. This inclination is subject to some varieties in several mountain trees. The cedar of Lebanon, for example, shoots the lower parts of its branches towards heaven, and bends the extremity downward toward the earth. They have the attitude of command which is suitable to the king of vegetables, that of an uplifted arm, the hand of which is inclined. By means of the first disposition the rain water is conveyed towards the trunk, and the second the snows, in the regions of which it delights glide from its foliage. Its cones have likewise two different positions, for it first bends them towards the ground, to shelter them at the season of flowering; but when they are fecundated it raises them up towards heaven. The truth of these observations may be confirmed by a young and beautiful cedar in the garden of plants at Paris, which though an exotic has preserved in our climate the attitude of a king, and the costume of Lebanon.

The bark of most mountain-trees is in like manner adapted to convey the rain water from the branches to the roots. That of the pine is in large perpendicular ridges; that of the elm is split and cleft longitudinally; that of the cypress is spungy like tow.

The plants of mountains and of dry situations have farther a character which is peculiar to them, in general, it is that of attracting the water which floats in the air in imperceptible vapors. The parietaria, or pellitory, which has derived its name "*a pariete*" because it grows on the sides of walls, has its leaves almost always humid. This attraction is common to most of the mountain-trees. All travellers agree in asserting that in the mountains of Ferro, one of the Canary Islands, there is a tree which every day furnishes that island with a prodigious quantity of water. The natives call it *garoe* and the Spaniards *santo* on account of its utility. They tell us that it is always surrounded with a cloud which distils abundantly down its leaves, and replenishes with water capacious reservoirs which are constructed at the foot of the tree, and afford a copious supply to the island. This effect is probably somewhat exaggerated, though reported by persons of different nations, but I give credit to the general fact. The real state of the case I take to be this, that the mountain attracts from afar the vapors of the atmosphere and the tree being situated in the focus of that attraction collects them around it.

Having frequently spoken in the course of this work of the attraction of the summits of different mountains the reader will not be displeased if I here present him with an idea of this portion of the hydraulic architecture of nature. Among a great number of curious examples which I could adduce and which I have collected among my materials on the subject of geography, I shall quote one extracted not from a systematic philosopher but from a simple and sprightly traveller of the last century, who relates things as he saw them, and without deducting from them any consequences whatever. It is a description of the peaks of the Isle of Bourbon situated in the Indian Ocean in the 21st degree of south latitude. It was drawn up from the papers of M. de Villers, who was then Governor of the island under the East

India Company. It is printed in the narrative of the voyage performed for the first time by French ships to Arabia Felix about the year 1709, and was published by M. de la Roque. 'Among those plains which are on the mountains of Bourbon,' says M. de Villers, the most remarkable, though no account has yet been given of it, is that which has been denominated the plain of the Caffres. In this plain there are a great number of aspen trees which are always green, the other trees have a moss more than a fathom in length, which covers their trunks and their large branches. They are dead, without foliage, and so impregnated with water, that it is almost impossible to make a fire with them. If with great difficulty you at length kindle some of the boughs, the fire is black without flame, yielding a reddish smoke, which spoils meat instead of dressing it; you can scarcely find in the whole plain a single spot where you can make a fire unless you choose some elevation near the peaks; for the soil of the plain is so humid that the water every where gushes out and you are continually in mud and wet up to the calf of the leg. * * * But from the thick fog which surrounds these peaks, from their continual haze, which wets as much as rain and which falls during the night, it is evident that they attract the vapors which the sun raises by day from the sea and which disappear by night. Hence is formed the sheet of water which inundates the plain of the Caffres, and from which issue most of the rivers and streams that water the island. A vegetable attraction is likewise perceptible in those ever-green aspens and trees constantly humid, with which it is impossible to kindle a fire. The island of Bourbon is nearly circular and rises out of the sea like the half of an orange. On the most elevated part of this hemisphere are situated the plain of Silaos and that of the Caffres, where nature has placed that labyrinth of peaks incessantly shrouded in fogs, planted like nine pins and lofty as towers.

If time and space permitted, I could demonstrate that there are a multitude of similar peaks on the chains of lofty mountains, of the Cordilleras, of Taurus and others, and in the centre of most islands, without the possibility of supposing, conformably to the received opinion, that they are the remains of a primitive earth which was raised to that height, for as we have before asked, what

could have become of the wreck of that earth the pretended evidences of which rise on every side upon the surface of the globe. I could make it evident that they are placed there in aggregations and situations adapted to the necessities of the earth, of which they are in some measure the reservoirs, some in the form of a labyrinth like those of the island of Bourbon, when they are on the summit of a hemisphere, whence they are destined to distribute the waters of heaven in every direction; others in the form of a comb, when they are placed on the lengthened crest of a chain of mountains, like the peaks of Taurus and of the Cordilleras; others grouped two or three together according to the configuration of the districts they water. They are of various forms and of different constructions, some are covered with earth, as those of the plain of the Caffres, and some of the Antilles islands, and which are at the same time so steep as to be inaccessible. These incrustations of earth prove that they have both fossil and hydraulic attractions.

There are others which are long needles of solid and naked rock; others are conical, or in the form of a table like the Table Mountain at the Cape of Good Hope, on which you may frequently see the clouds accumulate and spread out in the form of a table cloth. Others are not apparent but are entirely enveloped in the sides of mountains or in the bosoms of plains. All are distinguishable by the fogs which they attract about them and by the streams which flow in their vicinity. We may even rest assured that there exists not a single stream in the neighbourhood of which there is not some quarry of hydro-attractive and most commonly metallic stone. I ascribe the attraction of these peaks to the vitreous and metallic substances of which they are composed. I am persuaded that it would be possible to imitate this architecture of nature, and by means of the attraction of these stones to form fountains in the most parched situations. In general vitreous bodies and stones susceptible of polish are highly proper for this purpose; for when water is diffused in great quantity through the air, as at the time of a thaw, it is first attracted and adheres to the glasses and polished stone in our houses.

I have frequently observed on the summits of the mountains of the Isle of France effects similar to those of the peaks of the plain

of the Caffres in the Island of Bourbon. The clouds are incessantly collected around their peaks which are steep, and pointed like pyramids: some of these peaks are surmounted with a rock of a cubical form which crowns them like a capital, such is that which is there called Piterbooth after a Dutch admiral of that name: it is one of the highest in the island.

These peaks are formed of a solid rock, vitrifiable and mixed with copper; they are real electrical needles, both from their form and their substance. The clouds deviate perceptibly from their course to collect round them and sometimes accumulate in such great quantity, as to shroud them from the view. Thence they descend to the bottom of the vallies along the skirts of the forests, which likewise attract them, and there they dissolve into rain, frequently forming rainbows on the verdure of the trees. This vegetable attraction of the forests of this island so perfectly accords with the metallic attraction of the peaks of the mountains that a field situated in an open place in their vicinity, often suffers from the drought, while it is raining the whole year round in the woods at the distance of less than a musket-shot. By destroying part of the trees that crowned the eminences of that island, most of the streams which watered it were dried up: of these nothing now remains but the empty channels. To the same injudicious management, I ascribe the perceptible diminution of the rivers and streams in a great portion of Europe, as may be seen by their ancient beds, which are much too wide and deep for the volume of water they now contain. Nay, I am persuaded that to this cause must be ascribed the drought in the elevated provinces of Asia, among others in those of Persia, the mountains of which were, without doubt, imprudently stripped of trees by the first inhabitants. I am of opinion that if mountain trees were planted in France on the eminences and at the sources of our rivers, their ancient volume of water might be restored and many streams which have ceased to flow, would again appear in our fields. It is not among the reeds, nor in the depths of vallies, that the Naiads conceal their everlasting urns, according to the representations of painters, but on the summits of rocks, crowned with groves, and near to the heavens.*

* Ibid, p. 242.

Although the complete proof of the subject now under discussion is of great importance to India and other tropical countries it must be allowed that further and more exact investigation will be required before the correctness of the foregoing statements be fully established. But as it is of consequence for the success of future inquirers to collect the existing information from the numerous works through which we find it scattered, I have purposely selected all that I remember to have met with in the course of my readings for insertion here.

Humboldt and St. Pierre must be regarded as valuable authorities, but there is also very concise information on this interesting subject to be found in a memoir by M. Boussingault, concerning "the effects which the clearing of land has in diminishing the quantity of water in the streams of the district."* Whether the labours of the agriculturist are effecting any modification in the climates of the countries subjected to their agency is an interesting question which is now very generally canvassed. It is moreover inquired, whether the immense clearing away of woods in some districts, together with the draining of morasses which exert so much sway over the distribution of heat during the various seasons of the year exert likewise an influence upon the streams and rivers which water the district, either by diminishing the quantity of water which falls, or by inducing a more rapid evaporation from the surface, when the wide spreading forests has been laid low, and its place been supplied by well cultivated fields.

A variety of observations would indicate that such a change has been, and is being, effected. In many localities it has been thought manifest, that, for a certain number of years, the streams which were employed in propelling water wheels have very sensibly diminished. In other places, many have been led to conclude that the rivers have become more shallow; and the increasing extent of their beds, covered with pebbles on either side appear to attest the disappearance of a portion of their waters. Finally many abundant springs are now almost dry. These observations have principally been made in valleys which are surrounded by mountains; and it has been thought apparent, that this diminution in the quantity of the waters, has been nearly coincident

* Jameson's Edin. Phil. Journal, p. 85, vol. xxiv., 1838.

with the epoch when the hatchet was employed, without mercy or judgment, against the woods which were widely distributed over the surface of the country.

These facts seem to indicate that in those regions where the process of clearing has been extensively carried forward, less rain falls than formerly. This in truth is the opinion which most generally prevails upon the point, and if admitted without further examination we must necessarily yield to the conclusion that the clearing away of the forests diminishes the annual quantity of the rain which falls upon the district. But on the other hand, even allowing that all the circumstances alluded to have been satisfactorily ascertained, still it has also been observed, that since the clearing of the mountains the different torrents and rivers which seem to have lost a portion of their waters occasionally manifest such sudden and extraordinary rises, that extensive devastations are the frequent consequence. It has likewise been observed, that after great falls of rain the springs which had almost entirely disappeared, suddenly rise with unusual impetuosity, only to subside with corresponding rapidity. The natural inference from these latter observations, as will be at once perceived, is that we are not too readily to adopt the common opinion and to admit that the cutting down of the woods diminishes the annual fall of rain, for it may not be at all impossible not only that the actual quantity of rain has not varied, but that the quantity of water passing off in the running streams may be really the same, in spite of the apparent drought at certain periods of the year both in the rivers and the springs; and possibly the only difference will turn out to be that the flowing of the same mass of water has, owing to the clearing, become much more irregular. In illustration, we may remark that if the small quantity of water which is found in the Rhone during a certain part of the year, was precisely compensated by a sufficient number of great floods, the necessary consequence would be that it still conveys to the Mediterranean the same volume of water which it did at the epoch anterior to the extensive clearings which have been effected near its principal sources, and when, probably, its mean depth was not, as it now is, subject to great variations. If these were actually the case the existence of the forests would be attended with this advantage that they would in some degree

regulate and equalize the flow of the water. But if on the other hand the whole annual quantity of the flowing water becomes less as the clearing away of the forests extends then the effect must be attributed either to the rains becoming less abundant or to its evaporation being promoted by the ground not being covered with trees and being thus deprived of shelter against the sun's rays and the wind. These two causes, which always produce a similar effect, must generally be combined. Before, however, endeavouring to estimate their influence, separately, it will be proper satisfactorily to ascertain if it be irrefragably established that the water courses of a country, where clearing has been extensively accomplished, are truly diminished, and thus assure ourselves that the mere appearance of the phenomenon be not taken for its reality. And, after all, this is the important point of the inquiry ; for let it be once established, that the clearing of a country reduces the quantity of water in its running streams, the cause of this diminution is of secondary importance. We must now, therefore, inquire if we can find in nature a set of phenomena which will act as a criterion in resolving this question.

I regard lakes, whether met with in plains or in different stages of mountain chains, as highly qualified to throw light upon this discussion. These may be considered as natural gauges calculated to assist in valuing upon a great scale, the variations which may take place in the quantities of water which fertilize a country. If the volume of these waters undergo any variation, more or less, it is manifest that this variation, whether of excess or diminution, will be indicated by the mean level of a lake inasmuch as its mean level varies at different times of the year, according as the season is wet or dry. Thus the mean level of a lake will fall, if the annual quantity of running water in the streams of the district diminishes ; on the contrary, it will rise, if these streams become more copious ; and, finally, the level will remain stationary if the volume of water which runs into the lake experiences no change. In the following discussion, I have preferred the use of those observations only which relate to lakes which have no outlet; and the reason will be apparent as we wish to ascertain changes, which may not be very considerable. However I do not disregard such lakes as have an issue for their waters, for I am certain that the

study of such will also lead to very precise results. Before proceeding farther, I shall say a few words on the meaning I attach to the phrase, change of level.

It will not be disputed that one of the most interesting districts of the kingdom of Venezuela is the valley of Aragua situated at no great distance from the coast, possessing a warm climate, and a fertility of soil which can scarcely be surpassed. In it we observe every species of cultivation which distinguishes the tropics and upon the lesser hills which rise from the valley we observe with astonishment crops which remind us of European farming; corn grows admirably upon the heights which surround Vittoria. The valley is bounded on the north by the high land which forms the coast, on the south by the chain of mountains which separate it from Llanos, and both on the east and west a range of hills completely encloses it. By this very singular confirmation the rivers which take their rise within its enclosure have no issue, either towards the ocean or otherwise. Their waters therefore accumulate in the lowest part of the valley and form by their union the beautiful lake of Tacarigua, otherwise denominated Valencia. This sheet of water according to the testimony of M. de Humboldt exceeds in dimensions that of Neufchatel in Switzerland; it is elevated more than 1,300 feet above the level of the sea: its length is about thirty miles and its greatest breadth does not exceed seven or eight. At the time when M. de Humboldt visited this valley the inhabitants had long remarked the gradual drying up of the waters of the lake, which had excited their attention for thirty years. But, in truth, it is only necessary to compare the descriptions supplied by the older historians with its present state, to recognise after allowing the largest deductions for exaggerations, that the waters have very considerably fallen. The facts themselves speak most distinctly.

Oviedo,* who towards the end of the fifteenth century, so often traversed the valley of Aragua, positively affirms that New Valencia was founded in 1555, at the distance of half a league from the lake of Tacarigua; and M. de Humboldt found, in the year 1800, that town was more than three miles (2700 toises) distant from its banks. The aspect of the district exhibits addi-

* His Historia de la provincea de Venezuela was published in 1723.

tional evidence of a great change. The rising grounds which are somewhat elevated above the plain maintain to the present day the name of islands, which at a former period, was most accurately assigned to them, seeing they were surrounded with water. The space which has been exposed by the retreat of the waters has been transferred into most fertile fields for the cultivation of cotton, sugar cane and the banana tree. Those buildings which were reared in the immediate vicinity of the water are seen to be more and more forsaken by it. New islands made their appearance in the year 1796. An important military post in the shape of a fortress which was built in 1740, in the island of Cabrera, is now situated on a peninsula. Lastly, in two islands of granite, those namely of Cura and of Cabo-Blanco, M. de Humboldt discovered among the bramble-bushes, several yards above the level of the water, deposits of fine sand containing many helecites. Facts which are so speaking as these, and withal so well ascertained, could scarcely fail of exciting the ingenuity of the learned on the spot, in the way of supplying explanations of the remarkable change, and they all agreed thus far, that some subterranean conduit had been opened up which allowed the waters to flow freely to the ocean. M. de Humboldt when on the spot paid all due regard to this supposition and after an accurate examination, of the localities, came very decidedly to the conclusion, that the cause of the diminution of the waters of the lake of Tacarigua was nothing more than the extensive clearing away of the woods over the whole valley, during the course of the former half century. 'In laying low the trees,' he observes, 'which covered the tops and flanks of the mountains mankind in all climates, are at one and the same time entailing two great calamities upon succeeding generations, they are producing a scarcity both of wood and water.'

Since the time of Oviedo, who like all the older chronologists, is perfectly silent concerning any subsidence of the water of the lake, the cultivation of indigo, sugar, cotton, and cocoa, had been carried to a great extent. In the year 1800 the valley of Aragua maintained a population as dense as that of any of the most populous portions of France. The smiling prosperity which existed in the numerous villages which teemed with its industrious popula-

tion, could not be witnessed without the greatest satisfaction. Such was the prosperous condition of this charming country when M. de Humboldt was sojourning in La Hacienda de Cura.

After a lapse of twenty-two years it was my lot afresh to visit the valley of Aragua. I fixed my residence in the small town of Maracay. I soon found that, for many years, the inhabitants had been remarking not only that the waters of the lake had ceased to subside, but on the other hand, they affirmed they were very decidedly rising. The lands which had been formerly occupied in the cultivation of cotton were now submerged. The islands of Las Nuevas Aparecidas, which had risen above water in the year 1796 had now become shallows which were dangerous for navigation. The tongue of land near to Cabrera, at the northern side of the valley, was now so narrow, that the smallest rise in the lake altogether inundated it: and a steady breeze from the north-west was sufficient to submerge the road which led from Maracay to Nueva Valencia.

The fears, which for so long a time had annoyed the inhabitants on its banks, were now altogether changed in their character: and they no longer dreaded the entire disappearance of the lake. They were now anxiously considering if these successive invasions of the rising waters were about to overwhelm their properties, and those who had explained the previous diminution by the existence of subterranean canals were convinced they were now choked up and that nothing would save them but re-opening these conduits afresh.

During the two and twenty years which had intervened, important political transactions had occurred. Venezuela now no longer belonged to Spain. The smiling valley of Aragua had been the arena of the most bloody contests, and war and death had desolated those happy scenes, and greatly reduced the population. On the first cry of independence, a number of slaves obtained their liberty by fighting under the standard of the new republic. Its wide spreading cultivation was neglected: the forest trees, so luxuriant within the tropics, had again in a great measure usurped dominion over that region which its inhabitants after a century of constant and painful labour, had reclaimed. During the growing prosperity of the valley of Aragua, the numerous streams which fed the lake had been arrested and employed in innumerable irrigations, and their beds

were found dry for more than six months of the year. At the last epoch to which I have alluded, the streams being no longer so diverted, flowed without interruption. Thus, then, during the progress and continuance of agricultural industry in the valley of Aragua, when the process of clearing was pushed farther and farther, and when cultivation in every shape was advancing, the level of the water gradually subsided. More lately, on the contrary, during a period of misfortune, and, we would fain hope, but temporary, when the clearing was no longer continued and the cultivated lands have fallen back into their wild state, the waters having ceased to fall, are now very speedily assuming a decided rising movement.

I shall now direct my remarks to another quarter, without however leaving America, in which we find a climate analogous to that of Europe, and where we traverse immense districts producing the most valuable grains. I shall direct attention to the higher lands of New Grenada, and to those elevated valleys from 6,000 to 9,000 feet above the level of the sea which enjoy, throughout the year, a temperature of from 58° to 62° Fahr. Lakes are frequent among the Cordilleras; I might easily dwell upon many of these, but shall bring under review only those which have been the subject of previous observations.

The village of Ubata is placed in the vicinity of two lakes. It is an important fact that sixty years ago, those two sheets of water formed one only. The older inhabitants have observed the waters gradually diminish, and their shores extend themselves year after year. Fields of corn of the greatest fertility at the present time cover districts which thirty years ago were completely covered with water. The falling of the mean level of this lake will the more readily be credited by the consideration that an occasional fall of three or four inches lays bear a great extent of surface. If we inquire in the neighbourhood of Ubata of any of the old men, who in their younger days were devoted to the chase, or if we examine the records of any of the different parishes, no doubt will remain that numerous forests have been felled. The clearing still goes on: and it is equally certain that the retreat of the water has not ceased, though it does not advance so rapidly as it was wont to do.

The lake of Fuquena in the same valley and to the east of Ubata deserves marked attention. By barometrical measurements, made

with the greatest care, I have found that its waters have precisely the same elevation as those of Ubata. It is now nearly two centuries since this lake was visited by Don Lucas Fernandes de Piedrahita, Bishop of Panama, to whom we are indebted for the History of the conquest of New Grenada. This author, whose accuracy I have frequently had occasion to admire and more especially as it respects distances, gives the length of the lake Fuquena at ten leagues, and its breadth at three. By a very happy coincidence Dr. Roulin a few years ago had occasion to construct a plan of this same lake, and he found the dimensions to be a league and a half in length and half a league in breadth.

It may be conceived by some, that the dimensions adopted by Piedrahita are exaggerated. But this is not my opinion, and supporting myself on the one side by my barometrical observations, and on the other by the silence which all the ancient historians have maintained respecting the lake of Ubata, a silence which is the more remarkable since they have described far less considerable bodies of water, I am inclined to believe that at the time that the Bishop of Panama visited this country there existed only a single lake, which extended without interruption from Ubata to Fuquena. In this view the calculation of Piedrahita is in no degree exaggerated. At any rate, the fact of the retreat of the waters is much more important than the estimate of the extent of surface which is left bare, a fact which is not questioned by any one. All the inhabitants of Fuquena know well that the village was built quite close to the lake, and now it is about three miles distant from it. In former times it was an easy matter to procure timber for building in the environs of Fuquena. The mountains, which rise on all sides of the valley, used to be quite covered to a certain height with the trees peculiar to these elevated regions. There was the Cordillera oak (encinos) in abundance; and also a great many laurels (myrica,) from which great quantities of wax were procured. Now the mountains are nearly entirely bare, which great change is chiefly owing to the working the salt springs of Taosa and Enemocon. To all these authentic facts, whose number might be increased, it may be replied that the disappearance of the water, however incontestible, might possibly have occurred had there been no clearing of the ground, and it might be contended that their failure is owing to a wholly different

though it may be an unknown cause, and so must be ranked amongst the many phenomena whose existence is ascertained, though any thing like satisfactory explications is beyond our power.

It is true I cannot adduce here, as I did in the former case of Lake Valencia, a returning increase of the water on the suspension of the cultivation, and the renewed appearance of the woods. I may, however, procure some support for the opinion I am propounding from the extreme slowness of the present desiccation of the valley of Fuquena, since there have been no more forests to cut down. The cultivators of the soil perceiving that there is no longer the same retiring of the waters as formerly and a corresponding appearance of land, have been thinking of some more direct method than the clearing by which they might attain the same end. It was with this object that some speculative individuals thought of a plan by which they might drain off the whole water by cutting a deep water course. But, instead of dwelling on such speculative points as these I shall here adduce a direct proof; and I believe it may be found in continued attention to the same class of phenomena we have been dwelling on; I proceed, therefore, to demonstrate, that those lakes which are so circumstanced that no clearing has ever taken place in their environs, are not subjected to any alteration of their level.

I begin with lake Tota, because it is not far distant from Fuquena; also because these two are in very similar circumstances in a geological point of view; and, finally, because it is the most curious lake that is to be met with throughout the whole of New Grenada.

The lake Tota is situated at a great height in the Cordillera of Sogamoso; its elevation is above 12,000 feet. At this height vegetation almost entirely disappears. In the year 1652 the road skirted, as it still does, the margin of the lake, and the Seiches, which occurred then as frequently as they do now, often made the journey sufficiently dangerous as it is confined between the lake and a wall of elevated rocks. The waters lave the said rocks, and their level has undergone no more change than the sterile and desert country which surrounds them.

It may here perhaps be objected that I ought not to have introduced as an element in this discussion, the description of a lake which is situated on the extreme limit of vegetable existence. In

the apprehension, then, that the instance I have selected, inasmuch as I regard it a striking one may be set aside for the reason it exists in a locality composed of rocks and almost denuded of vegetation, I shall supply the description of some others which are less elevated than is Tota, and whose waters have remained stationary for ages, although they are placed in the centre of a rich country, whilst at the same time its agricultural aspect has undergone no change. I have examined some such near the equator, in the province of Quito.

On leaving Ibarra to go to Quito, we traverse a delightful valley, in which we meet with the lake San-Pablo, to which the Indians continue its ancient name Chilcapan. I found it was elevated about 8,500 feet above the level of the ocean. The temperature corresponding to this height no longer admits the cultivation of wheat or of maize, but instead, we perceive numerous fields of barley, oats and potatoes. The lower parts of the country consist of the richest pasturage, and the hills are covered with sheep, which are reared for the sake of their wool which supplies the extensive cloth manufactures of the district. The numerous villages which border on the lake existed even previous to the conquest, the great mass of the population is still purely Indian, they still preserve their old customs and their idioms, and in short matters appear in much the state they were under the empire of the Incas. The only essential difference, perhaps, which it would be possible to point out is that the rearing of sheep has been substituted for that of the lama, although these latter animals are still by no means uncommon. On the public roads we frequently encounter droves of these lamas, under the directions of the Indians who attend them, and who by their means transport their merchandise from place to place. It is a fact admitted by every one that the steppe of San-Pablo from time immemorial has never been wooded. Even under the Incas it was pasture-land. Folds for sheep which were reared on the lake more than a century ago, are witnesses that its waters have in no degree receded. The route, too, which Huayna-capac followed when he left Quito to undertake the conquest of Otavalu, marks to the present day the limits of the water.

The Cordillera which separates the valley of San-Pablo from the coasts of the southern ocean is covered upon the eastern slope, with

thick forests which are almost impenetrable. I note this circumstance, because I have the strongest conviction that an extensive clearing of wood were it to take place even on a lower level than an alpine lake, and at a considerable distance from it, would still exert an influence over the mean level of its waters.

We may here also notice, without removing from the locality we have thus introduced to notice, the singular lake of Cuicocha, which occupies a trachytic basin in which two islands, which have been examined with much care by Colonel Hall, attest the stability and the uniformity of its level. The study likewise, of the lake Yaguarcocha, or the lake of blood, so designated since Huayna-capac dyed its waters with the blood of 30,000 Canra Indians, whom he there slaughtered, would lead to a similar result. Neither of these lakes have any outlet. Instead, however, of dwelling upon them, I shall in preference select Chilcapan lake, and especially because it has a natural issue towards the north, whence rises the river Blanco. I wish to show by this selection that, as I remarked at the commencement of this discussion, those observations which are made upon bodies of water with such outlets are not to be neglected. The effect we might expect to be produced by a stream issuing from a lake is, that the stream would deepen its furrow and consequently lower the waters. I have, however, observed that in spite of this circumstance the level of lake Chilcapan has not been sensibly lowered. In attentively examining the trachytic rock in the spot from which the river Blanco takes its rise I have not been able to recognise any indication of the water producing an eroding effect.

I shall conclude what I have to observe concerning the lakes of South America by a few remarks upon the one called Quilatoa, because it has been accurately examined at two epochs, which are sufficiently distant from each other, the one being the year 1740 on the other 1831.

In travelling to Latacunga, a town situated at no great distance from Cotopaxi, a great deal is often heard of the wonders of the lake of Quilatoa. From time to time this lake throws out flames, which envelop the shrubs on its edge; and it likewise produces frequent detonations which are heard at a great distance. These statements were more than sufficient to induce M. de la Condamine, who was at Latacunga in September, 1738, to undertake an excursion to

it. He found it was almost circular, with a diameter of about 400 yards. The water was about 120 feet below the level of its abrupt margin.

It happened that I, too, found myself in the neighbourhood of this same lake in the month of November, 1831. It cannot be compared to any thing so accurately as to a crater, the bottom of which is filled with water. I found that it was elevated 11,800 feet above the level of the sea, and hence was in the cold region. It is surrounded with immense pasture grounds, and, 1,500 feet below it, there are the sheep-folds of Piliputzin. To the east the Cordillera which descends towards the coast is covered with forests which are almost unknown. The information which the shepherds who live in its vicinity gave us had little in it of the marvellous so often associated with it. They had never witnessed any flames issue from its waters ; nor had they ever heard any detonations. The result of my excursion to this lake was the observation, that all things, so far as level was concerned, were in the state they had been at the epoch of M. de la Condamine's visit.

The study of the lakes which are so numerous in Asia will probably lead to a result, in every respect conformable to that which has been deduced from the observation made in South America, viz., that the streams which water a country diminish in proportion as the clearing of it advances and its cultivation extends. The recent labours of M. de Humboldt who has supplied so much valuable information on this portion of the globe, seem to leave little doubt on this point. After having shown that the system of the Altai range extends by a succession of hills into the steppe of Kirghiz, and that, consequently, the Oural chain is not connected with that of the Altai, as has been generally supposed, this celebrated geographer demonstrates, that precisely at the place where we have been in the habit of placing the Alghinic mountains, a remarkable region of lakes commences which are continued into the plains which are traversed by the rivers Ichin, Omsk, and Ob. (See his Fragmens Asiatiques, t. i.) It might not be too much to say that these numerous lakes are the residue of the evaporation of a vast mass of water, which, in ancient times covered the whole country and which has been broken up into so many separate lakes by the configuration of the surface. In crossing the steppe of Baraba, that he might reach Barnaoul from Tobolsk

M. de Humboldt ascertained that the process of desiccation was every where greatly augmented by the effects of cultivation.

Europe also possesses its lakes, and these we have still to examine in relation to the subject before us. My own progress through Switzerland was much too rapid to allow me sufficiently to attend to the light these waters throw on this interesting point. My regret, however, is the less severe as fortunately a most illustrious observer has left some valuable documents which supply new proofs of the influence of cultivation upon the diminution of the quantity of water in the district.

Saussure, in his first researches concerning the temperature of the Swiss lakes, examined those which are placed at the foot of the lowest line of the Jura range. The lake of Neufchatel is eight leagues long whilst its greatest breadth does not exceed two leagues. In visiting this lake Saussure was impressed with the conviction that its limits at an early period must have been much more extensive; for, says he, the great level meadows and the swamps which terminate at the south-west extremity, have undoubtedly been covered with its waters. The lake of Bienne is three leagues long and one broad. It is separated from that of Neufchatel by a succession of plains which to all appearance were formerly under water. The lake Morat is also separated from Neufchatel by a level morass which no one doubts was formerly submerged. Formerly then, says Saussure, the three great lakes of Neufchatel, Bienne, and Morat were united in one great basin. In Switzerland, then, as in America and Asia, the ancient lakes which we may distinguish as the primitive ones, those which occupied the lower portions of the valleys, when the country was wild and uncultivated, have subsequently been separated into a certain number of independent ones by the drying processes to which it has been subjected.

I shall terminate my task by availing myself in this discussion, of the observations of Saussure upon the lake of Geneva. This interesting object was, as it were, the spot from whence the celebrated philosopher commenced his immense labours. No one ever studied it more deeply than he did.

Saussure admits that, at an epoch much anterior to the times of history the mountains which surround the lake were buried under water; some vast catastrophe occasioned a great disruption and

speedily the current of waters occupied no greater space than the bottom of the valley ; in short, the lake of Geneva was then formed. But turning from this to the monuments which have been constructed by man it is impossible to doubt that during the course of twelve or thirteen centuries, the waters of the Lake of Geneva have considerably retired. This is evident from the flat shores it has left near its margin, and, even in the town itself, the Quartier de Rive and the low streets have been built upon such sites. This lowering of the surface, continues Saussure, is not the result only of the wearing down of the channel whence its waters issue, it has likewise been produced by diminution of the quantity of the waters which flow into it. The general result which may be safely drawn from the observations of Saussure is that during the period of twelve or thirteen centuries, the running streams have gradually diminished throughout the districts in the neighbourhood of the lake of Geneva. And there is no one, I believe, will dispute that during that long period, there has been a vast clearing away of wood and a rapidly increasing advance in the cultivation of this beautiful country. Upon the whole, by the examination of the levels of lakes, we have arrived at this conclusion, that in those countries which have been extensively cleared, it appears very probable that there has been a diminution of the running streams which flow through the district, whilst, on the other hand, where no great change has been effected in this way, the streams have been subjected to no variation.

Great forests, therefore, in the point of view we are now regarding them appear to have the effect, first, of preserving the volume of water destined for the use of machines and of canals, and then to be an obstacle to the rain water collecting and running off with too much rapidity, being at the same time an obstacle to evaporation. That a surface covered with trees will not be so favourable to evaporation as a well wooded one is what every one will admit, without discussion. But that the difference of these two conditions may be adequately appreciated, it is necessary that the traveller should successively pass through a country which has been cleared and one which has not some time after the rainy season is over. It will then be seen that the portion of his journey in the forest is still covered with mud while those in the open country are completely dried. It is especially in South America that the obstacles to evaporation in a

region shaded with thick forests are conspicuous. In these situations the humidity is perpetual, even long after the rainy season is past. The paths which are formed through them are during the whole year nothing better than sloughs, and the only method of drying these forest roads is to make them as broad as 200 or 300 feet, which in fact is a method of clearing them.

When it is once admitted that the running streams are diminished as the result of clearing, it may then be important to examine whether this diminution arises from the quantity of rain being lessened, or from the greater evaporation, or finally if it be owing to irrigation.

I have already admitted at the commencement of this paper that it was nearly impossible to assign any exact proportions to these different co-operating causes. I shall, nevertheless, in conclusion, endeavour to appreciate their respective influence in a general way. And the discussion will subserve one important object if I prove that there may be a diminution of the running streams from the clearing alone without the simultaneous action of the other causes.

First, with regard to irrigation we may remark that it is necessary to distinguish between the case where extensive cultivation takes the place of a forest and that in which a sterile district which was never wooded becomes cultivated under the efforts of human industry. In the former case it is probable that the irrigation will contribute little or nothing in effecting any alteration in the mass of running water ; for it must be generally admitted that the quantity of water consumed by the vegetation of any given surface of forest, must equal if it does not exceed, that which would be absorbed by an equal surface devoted to culture after it has been cleared. From this it follows, that the influence exerted by this cultivated district corresponds to the condition of lands which have been cleared acting solely by favouring the evaporation of the rain water. In the latter case again that is to say where a great extent of uncultivated land shall have been reclaimed, there will be an evident consumption of water by the vegetation which has been there promoted : and the introduction of agricultural industry will under these circumstances tend to diminish the water-courses which traverse the country. It is very probable that we are to attribute to this circumstance the gradual drying up of the lakes which to a certain extent gauge the

running streams of the north of Asia. It is almost useless to add, that under circumstances of this nature, the effect produced by the simple evaporation of the rain water is not augmented ; on the contrary it ought to be rather less, for on a soil covered with plants water will not so readily evaporate as on one destitute of vegetation.

Again in the considerations I have supplied concerning the lakes of Venezuela, of New Grenada, and of Switzerland, the disappearance of a part of the flowing streams, which are tributary to these lakes, might be attributed simply to a more limited fall of rain ; whilst on the other hand, with quite as much reason it might be maintained it was the consequence solely of the more rapid evaporation of the rain water. Beyond doubt there are circumstances under the influence of which the diminution of the streams is the result simply of a more active evaporation. I meant to have produced a good number of examples bearing on this point. But in a discussion of this sort it is not so much numerous as well authenticated facts, that it is important to supply. Influenced by this consideration I shall limit myself to the production of two facts ; the one derived from M. Desbassyn of Richemond, who observed it in the isle of Ascension ; and the other drawn from my own notes being one of the observations I made during a sojourn of many years at the mines of Marmato.

In the island of Ascension, a beautiful spring has been noticed situated at the foot of a mountain which was originally wooded, by degrees the spring was less copious, at length failed ; during this process the forests were cut down and the mountain was cleared. The disappearance of the spring was attributed to the clearing. The mountain was again planted, and after a few years the spring re-appeared, became gradually more productive and finally was as copious as ever.

The metalliferous mountain of Marmato is situated in the province of Popayan in the midst of immense forests. The stream of water upon which the stampers are placed is formed by the union of many small brooks which take their rise on the plateau of San Jorge. The whole environs of the establishment are thickly studded with wood. In the year 1826, when I for the first time visited these mines, Marmato consisted of some miserable huts possessed by a few Negro slaves. In 1830 the epoch at which I quitted this locality, Marmato exhibited the most exhilarating appearance. There were now seen

great workshops, a foundry for gold, and powerful machines for the division and amalgamation of this precious metal. There was now a free population of nearly 3,000 inhabitants settled on the mountain side. All this implies that the wood had been extensively cut down for the manufacture of the machines, the construction of the buildings and the preparing of charcoal. That it might be the more easily carried on all this was done upon the plateau of San Jorge itself. The clearing had been going on for scarcely two years, when it was noticed that the quantity of water which was required for the machines had conspicuously diminished. The volume of water is in fact measured by the work which the machines perform; and trials by gaging, at different times, have likewise proved the diminution of the water. But this is at Marmato an all important subject, for a diminution of the fluid moving power is always followed by a diminution in the production of gold.

In these two cases of Marmato and Ascension it is not at all probable that an extent of clearing so local and limited could have such an effect upon the meteorological condition of the atmosphere, as in any degree to vary the annual amount of the rain which falls throughout the country. But the question need not be left in this uncertainty. At Marmato as soon as the diminution of the supply of water was ascertained a rain-guage was established, and it was found, by the observation of the second year that a greater quantity of rain had fallen than during the first, although the clearing had been continued and there was no appreciable increase of the quantity of water at the wheels. Two years of hydrometrical observations are sufficient even in the tropics to exhibit the variation in the annual quantity of rain, and the observations at Marmato establish that the mass of running water has diminished at the very time that the quantity of rain had increased.

It is then probable that local clearings of no great extent may diminish the copiousness of springs and rivers, and even cause them to disappear, and under circumstances where these effects can in no degree be attributed to a diminution of the fall of rain.

Finally, we have still to examine if the extensive clearing of forests, extending over considerable districts has any effect in making the rain less copious? In reply we remark that it is only hydrometrical observations that can lead to the solution of this question. And unfor-

tunately the observations of this sort which might be at our command, do not reach back far enough and, so far as Europe is concerned, they were not commenced till the whole clearing process was well nigh over. The United States of America, however, where the forests are disappearing with astonishing rapidity, may perhaps supply the required data at no distant period.

In studying the phenomena of rain under the tropics I have at length formed, in connection with this question of clearing, a very decided opinion, which I have freely communicated to many. I regard it certain, then, that a very extensive clearing diminishes the annual quantity of rain which falls upon a country.

It has long ago been remarked, that, in equinoctial regions the epoch of the rainy season returns every year with astonishing regularity. This is most true, whilst at the same time this meteorological fact ought not to be announced in terms too general. There is the greatest possible regularity in the alternation of wet and dry seasons in those countries whose territory is very much varied. Thus a country which at once exhibits forests and rivers, mountains and great plains, lakes and extensive table lands, will at the same time exhibit periodic or changing seasons with a regularity which is quite remarkable. This, however, is no longer true if the territory be more uniform, and if it become in any way peculiar. The epoch of the return of the rainy season will be much less regular if the face of the country be exposed and arid; also if cultivation to a great extent has partially taken the place of forests; and finally if the rivers are numerous, the cultivation be but limited, then the irregularity of the seasons will still manifest itself, but with quite a different character. Rain will then predominate, and in some years it will become, so to speak, continual.

The continent of America presents to us, in immense extent, two regions which are placed under the same conditions as to temperature, and in which we successively meet those circumstances which are the most favourable to the formation of rain and those which are of directly opposite character. In leaving Panama, and travelling towards the south we pass the Bay of Cupica the provinces of San Buena Vantura, of Choco, and of Esmeraldas. In this country, covered with thick forests, and furrowed by a multitude of rivers the rains are almost unceasing. In the interior of Choco, no day passes without rain. On

the other side of Tumbez towards Payta, an entirely different set of objects present themselves. The forests disappear, the soil is sandy, and of vegetation there is scarcely a vestige. Here rain, so to speak, is unknown; when I was at Payta, according to the testimony of the inhabitants, it had not rained for seventeen years. This want of rain is common in all the countries which border on the desert of Sechura, and extends as far as Lima. In these countries rain is as seldom seen as are trees.

Thus, in Choco, whose soil is covered with forests, it rains continually; on the coast of Peru, the soil of which is sandy, devoid of trees, and destitute of verdure, it never rains; and this, as I have already said, under a climate precisely the same as to temperature, whose exposure and distance from the mountains is very nearly the same. Peru is not at a greater distance from the Andes of Assuay than are the humid plains of Choco from the western Cordillera.*

In the case of Marmato the evidence furnished by the rain guage proved beyond a doubt that the diminution of the running water was not owing to a diminished fall of rain, as it was found by the observations of the second year that a greater quantity of rain had fallen than during the first; nor do I imagine the diminution was solely owing to the lands being deprived of the protection from the sun's rays which the leaves and branches afford, but the lands being cleared the fallen leaves and roots of the trees no longer existed to retard the flow of the water which fell: while 3,000 inhabitants of an active flourishing settlement engaged in the cultivation of the articles indispensable to the existence and comfort of man would soon cause on the table land of San Jorge the great change in the quantity of spring water which is the result of high cultivation, or agricultural improvement of a country. While the face of a country is rough the rain water remains long among its inequalities, slowly sinking into the earth to feed the springs or slowly running away from the surface, as from bogs and marshes, towards the rivers. The rivers hence have a comparatively gradual and regular supply even when rain has not fallen for a long time, but in a well drained and well cultivated country the rain by a thousand channels finds its way to the brooks and rivers, almost immediately, producing often dangerous floods or inundations of the neighbouring low grounds.

* Jameson's Edinburgh Phil. Journal, p. 85, vol. xxiv. 1838.

In addition to the moisture which trees bring to the earth in the form of rain they furnish a valuable supply by condensing the fogs which occur. In heavy fogs, in elevated situations especially, trees are perfect alembics, and no one, who has not attended to such matters, can imagine how much water one tree will distil in a night's time by condensing the vapour which trickles down the twigs and boughs so as to make the ground below quite in a float.

Trees in leaf have such a vast proportion more of surface than those that are naked, that in theory their condensations should greatly exceed those that are stripped of their leaves; but as the former imbibe also a great quantity of moisture it is difficult to say which drip most; but this I know, that deciduous trees that are entwined with much ivy seem to distil the greatest quantity. Ivy leaves are smooth, and thick, and cold, and therefore condense very fast; and besides evergreens imbibe very little. These facts may furnish the intelligent with hints concerning what sorts of trees they should plant round small ponds that they would wish to be perennial; and show them how advantageous some trees are in preference to others.

Trees perspire profusely, condense largely, and check evaporation so much that the woods are always moist, no wonder, therefore, that they contribute much to pools and streams. In Newton Lane in October on a misty day, an oak in leaf dropped so fast that the cart-way stood in puddles and the ruts ran with water though the ground in general was dusty. That trees are great promoters of lakes and rivers, appears from a well known fact in North America; for since the woods and forests have been grubbed and cleared, all bodies of water are much diminished: so that some streams, that were very considerable a century ago, will not now drive a common mill. Besides, most woodlands, forests, and chases, with us abound with pools and morasses, no doubt for the reason given above.

Trees require a great quantity of water to supply their organs. This is given off in perspiration by their leaves. In the experiments of Hales, of the quantity of water taken up by plants, it was found that a pear tree which weighed seventy-one pounds, absorbed fifteen pounds of water in six hours and that branches of an inch diameter, and from five to six feet high, sucked up from fifteen to thirty ounces in twelve hours. When these were stript of their leaves, they only sucked up one ounce in twelve hours.

The house in which we resided in Fife was built on a greenstone rock on the south brow of the high ground overlooking the beautiful river Leven, about two hundred feet above its level, and five hundred feet distant from it. We there remarked that, even in closets in the garrets, shoes and all kinds of leather, soon become mouldy, which could be produced only by the moisture generated by the trees, which in thick groves closely surrounded the house.*

Trees in full foliage have long been noted as great attractors of humidity and a young wych elm in full leaf affords a good example of this supposed power; but in the winter of the year when trees are perfectly denuded this faculty of creating moisture about them is equally obvious though not so profusely. A strongly marked instance of this was witnessed by me, when ascending a hill in the month of March. The weather had previously been very fine and dry, and the road in a dusty state; but a fog coming on an ash tree hanging over the road was dripping with water so copiously, that the road beneath was in a puddle, when the other parts continued dry and manifested no appearance of humidity. That leaves imbibe moisture by one set of vessels and discharge them by another is well known, but these imbibings are never discharged in falling drops: the real mystery was the fog in its progress was impeded by the boughs of the trees, and gradually collected on the exposed side of them, until it became drops of water, whereas the surrounding country had only a mist flying over it. Thus in fact the tree was no attractor, but a condenser; the gate of a field will in the same manner run down with water on the one side, and be dry on the other, as will a stick or a post, from the same cause. It is upon this principle that currents of air will be found under trees in summer, when little is perceived in open places and the under leaves and sprays will be curled and scorched at times, when the parts above are uninjured. The air in its passage being stopped and condensed against the foliage of the tree, it accordingly descends along its surface or front and escapes at the bottom where there are no branches or leaves to interrupt its progress. In winter there is little to impede the breeze in its course, and it passes through; consequently at this season the air under a tree is scarcely more sensibly felt than in the adjoining field.†

* White's Natural History of Selborne, p. 195.

† Journal of a Naturalist, p. 61.

Similar phenomena are constantly observed when the air is full of moisture, after the rainy seasons of India. One of the most marked instances which have fallen under my own observation, however, was one morning in 1838 to the westward of Secunderabad. The first hour's ride lay over a bare plain, the sand on which betrayed no appearance of moisture, but on entering a plantation enveloped in a fog my clothes were soon saturated by the fog, which existed there, being condensed by the leaves overhead. In the islands lying in the tract of the south-east trade winds, their mountain summits covered with wood are formed by the leaves and branches into an unceasing condensing apparatus, while the closeness of the trees and the dense foliage prevent the ground they shade ever drying. This was finely shown to me in December, 1834, when in the Isle of France. At sunrise along with some companions, I left the plains on which were growing the orange, the pine-apple, and the palm trees of the tropics, and advancing up the mountain we first passed over ground cleared of wood where the sheep of the farmers were grazing, and then entering upon a small tract which led directly up the mountain we soon became involved in the gloom caused by the shade of the gigantic black wood trees which grow there. We passed by several immense masses of rock which having been detached by some accident from a higher situation, had come sweeping down the mountain's side, leaving in their tracts uprooted and overthrown trees.

Shortly after we entered this forest it rained for a short time but soon cleared up; but when we had almost reached the summit a fog so dense came on that our party wandered from the road, this fog was so fast condensed by the leaves of the trees that the drops fell from them much more rapidly than the rain had fallen, and before the slaves, who were our guides, could extricate us from the forest, we were completely drenched. I had gone up with the intention of collecting specimens and had only obtained one (the hedgehog of tropical climates and supposed peculiar to Madagascar) when this condensation of vapour commenced, and while being thus drenched from the fog on the summit of the hill the sun was shining on the plains and the reports from the fowling pieces of the sportsmen there were heard every minute.

This remarkable condensation of the moisture in the air of the mountains of the Mauritius may possibly have been observed by all who have ascended them, as Mr. H. Hayter describes having wit-

nessed a similar phenomenon when lately climbing to the tops of the Peter Botte mountain there. At dawn of day, he says, we snatched a hasty breakfast and were fairly on the move by six o'clock. Our route lay up a steep ravine at the lower part of which grows a dense forest of ebony and " bois de natte" through which we made our way and soon got completely wet through from the dripping of the dew from the branches of the trees and long grass.*

There is one more means by which the vegetable world collects the moisture of the atmosphere, viz. by forming dew. Although the advantage a climate derives from this is not so apparent, yet the supply obtained is by no means scanty or devoid of utility, for it assists in the nourishment of the plant and enables it to supply the wants of man with its fruits and to scent the air with the fragrance of its flowers. When it is mentioned that the quantity of dew deposited during the year in Britain is reckoned at five inches, (half the quantity of the rain, which fell in 1838 at Bellary,) the agreeable freshness such a quantity of moisture will cause when again becoming vapour will readily be comprehended. The quantity of moisture taken up by the atmosphere during the day very much influences the quantity of dew which falls at night. Dew is first deposited on the bodies, which radiate heat most powerfully as grass, twigs, and leaves of trees; some trees however, are even famous for the quantity of water they collect from dews which hang about them, and there is not, perhaps, among all the numerous examples that occur of the provident economy of nature in the vegetable world, a more remarkable instance than that displayed in a plant commonly met with in Ceylon and other islands of the east, and which has obtained the appropriate name of the pitcher plant.

Being the inhabitant of tropical climates, and found on the most dry and stony situations, nature has furnished it with the means of obtaining an ample supply of moisture without which it would have withered and perished. To the footstalk of each leaf near the base is attached a kind of bag, shaped like a pitcher, of the same consistence and color as the leaf in the early stage of its growth, but changing with age to a reddish purple. It is girt round with an oblique band or hoop and covered with a lid neatly fitted and moveable on a

* Recent ascent of the Peter Botte Mountain, by Mr. Hayter, Illustrated London News, p. 142, 2d September, 1848.

kind of hinge or strong fibre which passing over the handle connects the vessel with the leaf. By the shrinking or contracting of this fibre the lid is drawn open whenever the weather is showery or dews fall, which would appear to be just the contrary of what usually happens in nature, though the contraction, probably, is occasioned by the hot and dry fibre: and the expansion of the fibre does not take place till the moisture has fallen and saturated the pitcher. When this is the case, the cover falls down and it closes so firmly as to prevent any evaporation taking place. The water being gradually absorbed through the handle into the footstalk of the leaf, gives vigor to the leaf itself and sustenance to the plant. As soon as the pitchers are exhausted, the lids again open to admit whatever moisture may fall, and when the plant has produced its seed and the dry season fairly sets in it withers with all the covers of the pitchers standing open.

The manner in which Providence has contrived a supply for the thirst of man in dry situations is equally worthy of admiration. On some parched districts of Africa nature has planted a great tree called by the negroes Poa, the trunk of which of prodigious bulk is naturally hollowed out like a cistern. In the rainy season it is replenished with water, which it keeps cool during the most intense heat by means of the tufted foliage which crowns its summits. Finally, she has placed vegetable fountains on the arid rocks of the Antilles; you commonly find on them a liane called the water liane, so full of sap that if you cut a single branch as much water is immediately discharged as a man can drink at a draught: it is perfectly pure and limpid. In the lagoons of the Bay of Campeachy travellers find relief in a different manner: these lagoons, on a level with the sea, are almost entirely inundated in the rainy season, and are so parched in the dry season that hunters who have accidentally lost their way in the forests by which they are covered, have actually perished of thirst. The celebrated navigator Dampier relates that he several times escaped that calamity by means of a very extraordinary species of vegetation, which had been pointed out to him on a kind of pine very common in those parts. It resembles a parcel of leaves placed one over the other in stages and on account of its form and the tree upon which it grows he calls it the pine-apple. This apple is full of water, so that on piercing the lower part of it with a knife a good pint of very clear and wholesome water immediately

flows from it. Father du Tertre relates that he often found the same kind of refreshment in the horn shaped leaves of a species of balisier, which grows on the sandy shores of Guadaloupe. I have heard many of our sportsmen remark that nothing is more proper for quenching thirst than the leaves of the misletoe which grows on our trees.

The thick green leaves of plantain trees readily condense the moisture of the atmosphere, and there is at all times within their different layers a quantity of pure clear water which may be collected by making an aperture in their stems. A tree of a similar character exists in the Mauritius, and the first time I became aware of this I received an agreeable surprise when the gardener at Pamplemoos plunged his knife deep into its stem and allowed the stream of pure water to spring in a jet from the wound.

Such are in part the precautions employed by Providence, to compensate in favor of man the inconveniences of every climate by opposing to the qualities of the elements contrary qualities in vegetables.*

The facts detailed seem to establish,

1st. That the extensive clearing of a country diminishes the quantity of running water which flows over its surface.

2d. That it is impossible for us to determine, at present, whether this diminution is owing to a smaller annual fall of rain or to an increased evaporation of the surface water, or to these two causes combined.

3d. That it is however shown by the authors above quoted that rain oftener falls, and that more dew is deposited in well wooded countries than when the country is naked; and, drawing our conclusions from the meteorological facts collected in equinoctial regions, we may presume that the extensive clearing of a country diminishes the actual quantity of rain which falls upon it.

4th. That mountains, particularly when covered with their native forests, by an electric action on the atmosphere, cause clouds to form around them; collect and condense the vapours of the air, and equalise the fall of rain.

5th. That the forest trees which grow on mountain summits have a structure peculiarly fitting them to receive the waters of the clouds.

6th. That lands destitute of the shelter of trees allow of more rapid evaporation.

* St. Pierre's Studies of Nature, vol. ii. p. 322, ed. 1846.

7th. That independent of the preservation of surface water forests husband and regulate its flow.

8th. The above authors also show that in all forest tracts the temperature of the air is more equable throughout the year : that in tropical regions the atmosphere around trees is cooler and contains more moisture than the air on the open glade ; that the atmosphere of a tropical country without trees, has an arid dryness in it totally dissimilar to the cool softness of a well wooded one; that lands covered with trees are cooler and moister than those which are exposed : that in hot climates the destruction of forest trees, by inducing aridity, destroys vegetation ; and that forests and trees afford the shelter from violent winds which is absolutely essential to the health of the vegetable creation.

9th. That springs draw their supplies from sources in their immediate vicinity, and the presence of trees near these sources, seems to prevent the dissipation of the supply of water.

10th. That in clearings which are purely local springs may disappear without there being any ground to conclude that the annual quantity of rain has diminished.

11th. That the tenacious clayey under-soil found in forests is peculiarly adapted for preserving the surface and subsoil waters.

12th. That there is a difference in the condensing power of trees, but, by means of the vegetable creation, a valuable supply of moisture is collected from fogs, and from the atmosphere in the form of dew.

If the facts detailed warrant these deductions it may be confidently asserted, that Southern India would be greatly enriched and its climate ameliorated by the introduction of arboriculture.

It is only the government or the civil servants of the state who could accomplish any thing on a great scale, but their efforts may be seconded by every individual resident in it, and the man who makes a few trees grow where none grew before will be a benefactor to this country.

It is highly improbable that this cultivation would ever be carried to an excess likely to injure the health of the neighbouring inhabitants. The danger to Europeans at least, are purely imaginary and equally so in my opinion to the native population, although their spare diet and spare forms, their food and mode of life greatly expose

them to the influence of vitiated air. But even with every excess we may with full confidence assert that the increased mortality which many most gratuitously assume as the inevitable consequence of much vegetation, would never amount to five hnndred thousand, the number of the native population that are said to have died in 1839, in India, of famine alone.* A famine sweeping whole cities nay whole districts from the earth must far exceed, in the amount of misery and number of deaths it occasions, the hardships which would be entailed on a family by one of its members being carried off from a more sickly climate, even supposing that the planting of trees would ever become excessive or cause a climate to become worse, which I do not believe.

Many famines have occurred in this country and one or two of them may have been caused by wars, and other causes unconnected with climate, but most of them have been owing to droughts, and our efforts to prevent their recurrence must be made to procure an ample supply of water; for rich as the soil is in many parts of India, the soil acts a very secondary part. In a tropical country water is all in all: for let the soil be ever so stony or sandy a good supply of water will make various grains spring from it in abundance. But to obtain our utmost supply of water from the atmosphere we must plant trees: to prevent the rain as soon as it falls from rushing to the rivers and thence to the ocean, in fact to retard its flow and thus be enabled for a longer period to employ it for agricultural purposes, we must plant trees, and we must plant trees in order to have a few springs of water trickling from the mountain sides.

Were the hills in India covered with trees neither the torrents, which rush from them during the rainy season, nor the dry cracked and burned up appearance that they present during the hot season would longer be seen. If we can imagine the mountains in the Mauritius near the Petre Botte or the Petre Botte itself instead of being covered with tall trees to be perfectly bare of wood, in the first place none of the clouds which so frequently hang on their summits would ever be condensed, and the rain if it fell would rush down the rocky sides of the mountains in torrents, their beds becoming dry the moment the rain ceased; but with their well clad sides much water is

* *Agra Ukhbar* for January, 1840.

derived from the clouds which would otherwise fly off without contributing to the earth's demands, and both this supply and that which falls on them as rain runs slowly among the roots of the trees and under shrubbery to the plains below, or sinking into the crevices of the rock it springs out at a lower level, affording to the inhabitants a continual supply of pure water.

Considering the great numbers famines* have destroyed it cannot seem an unnecessary anxiety again to urge that trees be extensively planted to obtain a more abundant and more regular supply of rain for the country, to endeavour to prevent their recurrence. And while effecting this object we would likewise be obtaining wood for economic purposes, and when it is mentioned, that in many parts of the peninsula of India, the natives use masses of granite or hornblende rock as wheels for their carts, it is superfluous to make further comment on the scarcity of this useful article.

It is not my object here to allude to the mode of cultivation, nor to the species of trees which should be cultivated, but I may just remark that in cold climates where there is abundance of water, shelter from the inclement winds seems the great want to be provided for ; while, in this country, the chief provision required, is water. But should the recommendation now made ever be acted upon, there seems no occasion for Government to incur the unnecessary expense that would be the result of planting good productive land with trees of a description difficult to rear or requiring to-be attended to and watered for years ; for besides the fact that it is the forest trees on mountains, which are most useful, there are some kinds of trees which will take root and grow any where, and if such be selected and their seeds sown at the proper seasons many of the unproductive lands in India might be covered with trees, and thus become subservient to man.

EDWARD BALFOUR, Assistant Surgeon,
Madras Army.

* Within the first five years from our first acquisition of the technical sovereignty of the Bengal Provinces in 1765, a famine prevailed which swept off in two years time one-third part of the entire population—probably an exaggeration, but which is not denied by any party—destroyed as many of the human race as the whole inhabitants of the present kingdom of Holland.

Extract from the Minutes of Consultation.

Para. 1. The Right Honorable the Governor in Council has perused with much pleasure and satisfaction, the valuable and very interesting Report furnished by Assistant Surgeon Balfour on the effect of trees on the climate and productiveness of a country, and deeming it of importance that the local Revenue Officers should be in possession of information so intimately connected with the welfare of the districts under their respective charges, he resolves to direct that copies of the same be printed at the *Fort St. George Gazette Press* for general distribution and for transmission to the Government of India, and the Governments of Bengal, Bombay and Agra, and the Honorable the Court of Directors.

2. In Extract Minutes of Consultation, dated 8th October, 1847, No. 1116, the Government called for information on the same subject through the Board of Revenue, and it is the intention of the Governor in Council similarly to have printed and circulated for the use of the Revenue Officers all reports which may be deemed by the Board as useful and inducing suggestions for practical purposes.

3. It will be for the Board of Revenue when they shall have received all the information forthcoming on this subject to consider the measures it will be necessary to take to prevent the too great clearance of forests where they exist, and to promote their growth where they do not, or where they have been thinned. The propriety of restricting leases for large tracts of forest land for cultivating purposes should also be had in view, and every opportunity taken in connection with the usage and rules for planting topes and trees in the several districts, of forming continuous and extensive plantations of wild trees of large growth in suitable positions. It is believed that when the local Officers interest themselves in the welfare of a district and feel how much of it is dependant on the growth of forests, neither difficulty nor the expense of raising up forest tracts will be great. It is the practice at present in some districts to make an annual disbursement for planting palmyras for Revenue purposes, an extension of the principle, and a judicious selection of the sites and description of trees seem alone necessary to ensure success in the department to which the Home and the Indian Governments have now turned their attention.

4. Various other points may occur to the Board, or suggest themselves on a perusal of the reports which may be furnished to them, and the Government expect that the Board will take the same interest as they themselves feel, and propose for practical operation whatever they may consider conducive to the well being of the country.

5. The Governor in Council resolves to furnish to Assistant Surgeon Balfour a copy of the foregoing Proceedings, and to convey to him at the same time the thanks of Government for his interesting communication.

REVENUE DEPARTMENT.

No. 488.

Extract from the Minutes of Consultation, under date the 18*th May*, 1849.

Read the following letter.

No. 9.

From Major General W. CULLEN, *Resident at Travancore and Cochin.*

To J. F. THOMAS, *Esq., Chief Secretary to Government, Fort St. George.*

SIR,—I have the honor to acknowledge receipt of a letter from the Secretary to Government No. 1118 of the 8th October, 1847, with its enclosures, copy of a letter from the Government of India, and of a despatch from the Honorable the Court of Directors, requiring information "respecting the effect of trees on the climate and productiveness of a country or district, and the result of extensive clearances of timber."

From my own knowledge of the features and general appearance of these two provinces, Travancore and Cochin, I was not of opinion that any such considerable, and at the same time permanent clearances of forest lands had taken place within the last half century, as to cause any sensible effect upon the climate or productiveness of the country.

I have observed in various places partial clearings, but these appear to have generally been followed by the abandonment of equal tracts of previously cleared land, for the clearances have not been the consequence of a steadily increasing population, and therefore permanent in their nature, but chiefly from the mere nomad propensities of a scanty hill population, aware of the superior fertility of all such newly reclaimed land. The heaviness of the rains and the

general fertility of the soil, rapidly promoting the regrowth of forests on the tracts previously cleared. At the same time I have no doubt that the process of clearing is slowly advancing under these sirkars, and that it may in due time have a certain effect on the climate and apparent productiveness.

I have been able to procure but little satisfactory information on these subjects from individuals settled in the country, but I have forwarded herewith copy of a letter from the Dewan of Cochin, as also copy of a private note from the Reverend Mr. Mault, of the London Mission Society, who has been settled for the last 30 years nearly at Nagercoil in the south of Travancore, and who has had much opportunity of observation in his visits to his different schools and chapels in the interior.

It is facts, as the Reverend Mr. Mault observes, however, and not opinions, that are really valuable, but after all, how few are the facts that are procurable ; we can obtain little else any where than the result of casual observation and experience :—the remarks even of the celebrated Humboldt appear to be supported by but few, if any, actual meteorological data.

On the effect of cutting down forests he observes, that " they affect the copiousness of springs, not as was long believed by a peculiar attraction for the vapours diffused through the air, but because by sheltering the soil from the direct action of the sun, they diminish the evaporation of the water produced by rain."

" When forests are destroyed, as they are every where in America by the European planters, with an imprudent precipitation, the springs are entirely dried up or become less abundant."—Personal Narrative, vol. 4, p. 143-4—and

Again " with the destruction of the trees, and the increase of the cultivation of sugar, indigo, and cotton, the springs and all the natural supplies of the lake of Valencia have diminished from year to year." Vol. 4, p. 144.

No meteorological observations, however, are given in support of these conclusions, at least not in the Personal Narrative.

Monsieur A. Moreau de Jonnes, a Staff Officer in the Army of Belgium, obtained about the year 1828 a prize for an essay on these subjects, from the Philosophic Society of Brussels. He maintained:

1st. That " the clearing of woods makes the temperature of countries warmer."

2d. "That more rain falls on the sea coast than in inland districts, and that, when chains of mountains run parallel to the sea shore, the sides next the sea receive more rain than their opposite sides."

3d. "That woodlands in flat countries do not perceptibly increase the quantity of rain, but that woods on mountains have a perceptible influence in producing that effect."

Monsieur Moreau de Jonnes' work is stated to have originated in representations at the commencement of the French Revolution, of the injurious effects on the climate, &c. of France by the rapid cutting down of forests.

In France in 1750 the woods are stated to have occupied $\frac{1}{4}$ of the surface of the country; in 1788, $\frac{1}{7}$, and in 1814 only about $\frac{1}{12}$. In England, according to M. Moreau de Jonnes, the woods occupy only about $\frac{1}{23}$ of the surface.

There is also an interesting paper on the subject of climate, as affected by the clearances of forests, in Silliman's American Journal of Science and Art, by Dr. Forry of the United States.

"Dense Forests," he observes, "and all growing vegetables, doubtless tend considerably to diminish the temperature of summer, by affording evaporation from the surface of their leaves, and preventing the calorific ray from reaching the ground."

"Snow lies longer in forests than on plains, because in the former locality, it is less exposed to the action of the sun."

"At Hudson's Bay the ground in open places thaws to the depth of 4 feet, and in the woods to the depth of only 2 feet."

"Moreover, it has been determined by thermometrical experiment, that the temperature of the forest at the depth of 12 inches below the surface of the earth, is, compared with the adjacent open field, at least 10° lower during the summer months, while no difference is observable during the season of winter."

Lyell in his principles of geology observes, that "in the United States of N. America it is unquestionable, that the rapid clearing of the country has rendered the winter less severe, and the summer less hot; in other words, the extreme temperature of January and July have been observed, from year to year, to approach nearer to each other: whether in this case, as in France, the mean temperature has been raised seems by no means yet decided, but there is no doubt that the climate has become, as Buffon would have said, 'less excessive.'"

Dr. Forry remarks on the above passage that "it is unsustained by any well observed facts."

Dr. Webster, another American writer on the climate of N. America, arrives from a most extensive investigation of historical facts at the conclusion, "that the winters have been from the first settlement of America variable; now mild, now severe, just as they are in the present age." A leading object with him is to show the error of Dr. Williams, who, having maintained that the mean temperature of Italy "has increased 17°, wished to establish some analogous change in our climate since its occupation by Europeans, and Doctor Webster proves most conclusively, that, if Doctor Williams is unfortunate in his facts, he is still more so in his reasonings and deductions."

Dr. Webster concludes with the following passage as 'the result of clearing the forests.—"From a careful comparison of these facts he says, it appears that the weather in modern winters is more inconstant, than when the earth was covered with wood at the first settlement of Europeans in the country; that the warm weather of autumn extends farther into the winter months, and the cold weather of winter and spring encroaches upon the summer," &c.

Dr. Forry concludes his interesting paper with the following remarks: "that climates are susceptible of melioration by the extensive changes produced on the surface of the earth, by the labors of man, has been pointed out already; but these effects are extremely subordinate, compared with the modifications induced by the striking features of physical geography, the ocean, lakes, mountains, the opposite coasts of continents, &c."

Again: "The fallacy of the opinion which ascribes the mild climate of Europe to the influence of agricultural improvement becomes at once apparent, when it is considered, that the region of Oregon lying west of the rocky mountains, which continues in a state of primitive nature, has a climate even milder than that of highly cultivated Europe in similar latitudes; and again, China situated like the United States on the eastern coast of a continent, though subjected to cultivation for several thousand years, possesses a climate as rigorous, and some assert even more so, than that of the United States on similar parallels."

It is singular, however, that in the foregoing elaborate paper, no

estimate is attempted to be formed of the actual area cleared of forests within the last hundred years.

My own attention has of late years been much given to the subject of the fall of rain, as connected with the vicinity to high ranges of mountains:—I had noticed the accounts of the great annual fall of rain on the Mahabaleshwar hills, and at Merkara in Coorgh; and several years ago, with a view to similar observations, I established a rain guage on the summit of the high range of ghat mountains 22 miles east of Trevandrum, and where I found the fall of rain to be from 4 to 6 times the quantity on the sea coast. The obstruction to the passage of the vapour from these mountain chains, and its consequent condensation, the monsoon winds being nearly at right angles to the line of ghats, seemed to me to offer so decided and satisfactory an explanation of the phenomena, that I at once adopted it. These observations on Uttree Mullay and other tables of the fall of rain, which I have for several years past been collecting, although without reference to, or in illustration of any particular theory, may be of some interest in the present inquiries, as to the effect of forests in promoting the fall of rain.

I have established rain guages all along the sea coast from Cape Comorin to the latitude of Ponany, and I have also by the assistance of friends, been enabled to get several sets or lines of registers running directly inland; and perpendicular to the line of coast, for a distance of about 60 miles; thus exhibiting, not only the effect of distance from the sea, but also that of contiguity to the great chain of ghats separating Malabar from the provinces of the Carnatic.

The first of these inland lines is from Quilon to Shenkotah and Palamcottah, with rain guages at

		Distance.	Altitude above Sea.	Rain.
		Miles.	Feet.	Inches.
Inland Lines.				
Quilon,		Sea Coast	25	65
Kept by W. Huxham, Esq.	Puttnapoorum	25	150	99
	Shalakurray,	30	160	106
	Koraventavalum,	36	350	113
	Caldoorty,	41	750	128
Line of Ghats.				
Shenkotah		52	600	44
Palamcottah		70	150	24

It will be observed from the map, that Puttnapoorum the 1st station from Quilon, at 25 miles from the sea, is just where the high road enters the mass of high mountain ridges and spurs running out from the great chain of ghats.

From hence to the pass through the ghats, an interval of about 20 miles, is a dense mass of chains and groups of high mountain ridges from two to four and five thousand feet in altitude, running parallel to each other in a north-westerly direction, and covered with primeval forests. The gradual increase in the fall of rain up to Caldoorty at the very base of the ghats is very remarkable, as well as its sudden decrease on the east of the ghats at Shencottah, an interval of only 12 miles, causing a diminution from 128 to 46 inches.

There are no forests of consequence at Puttnapooram, nor for several miles farther to the eastward, and the fall of rain therefore should have diminished rather than increased as we proceeded inland; but, as I have already noticed, the groups and chains of mountains commence at that place, and they become more numerous and higher as we approach the main line of ghats.

The increase therefore, in the fall of rain at Puttnapooram, and from thence to Caldoorty, I should be disposed to ascribe almost exclusively, to the obstruction offered to the passage of the vapour over these high chains of mountains, and to its consequent condensation, and in no way to any effect of the forests.

Very remarkable examples of this effect of continuous chains of high land, in arresting and condensing the passage of the vapour have been recently afforded in the tables of the fall of rain on the Mahabaleshwar hills, at Mercara in Coorgh, and on the table land called Uttree Mullay, in the chain of ghats east of Trevandrum, and published in the proceedings of the British Association for the advancement of science—all of these places being from four to nearly five thousand feet above the sea.

Uttree Mullay is a continuous mass of high land, running for several miles nearly parallel to the coast, in the latitude of Trevandrum, and upwards of 4,500 feet above the sea. While the fall of rain at Trevandrum is only from 50 to 60 inches,—on Uttree Mullay it is not less than, from 240 to 280 inches.

The slopes of the mountains are clothed with forests of tall trees, but on the summit, although with much wood, the trees are comparatively dwarf and stunted.

Dalton with reference to the effect of mountains in augmenting the fall of rain observes, that " the inferior, warm, and vapoury strata of air, striking against the mountains, are made to ascend into the colder regions, by which means the vapour is precipitated; the situation of places however, may be too high to experience an extreme in this respect, thus the rain in Switzerland and amongst the Alps is not probably greater than the north of England." So Ootacamund on the Neilgherries, where the rain is under 50 inches, would seem to be "too high;" it is above the ordinary plane of precipitation, or lower stratum of cloud vapour; besides which, it is 15 miles east of the line of ghats, and 770 miles from the sea coast; whereas, Uttree Mullay is only 22 miles from the sea and immediately on the western crest of the ghats.

The county of Cumberland in England also affords some interesting illustrations of the effect of mountain masses, in arresting and condensing the vapour:—In a paper by Mr. Miller, of Whitehaven, on the fall of rain in the lake districts of that county, he shows, that the fall in 1844-1845 at Gatesgarth, close into the mountains was 88½ inches, and at Seathwaite in Borrowdale, 56 inches in 7 months, (equal to upwards of 100 inches in the whole year)—while in the more open parts of the county at Keswick and Whitehaven, the fall was only 44 and 38 inches respectively.

23. The second line of rain observations is from between Alleppy and Cochin on the sea coast, nearly east to Thodawully, at the base of, and to the Perreyaar river, &c. on the central or cardamom table lands of Travancore, with rain guages as follows:

	Distance. Miles.	Altitude. Feet.	Rain. Inches.
Alleppy and Cochin, (mean)	Sea Coast	12	100
Thodawully,....................................	30	120	142
Perreyaar river,........ } On the Table } ...	50	2500	84
Top of Cummum Pass, } Land, ... } ...	60	3500	38

From Cochin to Thodawully is in the low country, but on leaving Thodawully, which like Pathanapooram is just at the commencement of the spurs and ridges running out from the main chain of ghats,—you ascend a very beautiful and extended table land, the first station on which is at the Perreyaar river in the very centre of the upper country; the 2d station Cummum is on the eastern crest of the table land, overlooking the low country of Dindigul.

The fall of rain at Thodawully at 30 miles from the sea is even greater than that at Caldoorty on the Quilon line at 40, but the fall of rain appears to increase as we go north, on the sea coast, as well as inland, and the actual difference here, between the coast and the inland stations, is less than on the Quilon line, as might be expected from the spurs and ridges from the main chain of ghats being of less depth and less altitude.

At Shalakurray, 30 miles from the sea, the fall is nearly double that at Quilon,—whereas at Thodawully, also 30 miles from the sea, the fall is barely half more than at Cochin or Alleppy.

A third series of observations is about 35 miles north of Cochin from the sea coast, near Chowgat by Trichoor to the town of Chittoor in the Cochin district of the same name, and in the very midst of the great opening in the ghats at Palghatcherry.

I have no observations at Chowgat, but have assumed that it is the same as at Cochin thus:

	Distance.	Altitude.	Rain.
	Miles.	Feet.	Inches.
Chowghat,	Sea Coast	12	88
Trichoor,	12	50	101
Chittoor,	52	300	60

I was not prepared at first to account for the greater fall of rain at Trichoor, 12 miles inland, for the country immediately about it is flat and open, but there are numerous and continuous high chains of hills crossing the whole country, to the eastward, within 5 or 6 miles; and it may therefore be considered as another and most interesting proof of their effect, in augmenting the fall of rain.

On the two former lines the fall of rain increased as the mountain tracts were approached and entered, but on this last line the very reverse takes place, the fall of rain at Chittoor 52 miles from the sea being only 60 inches, or but little more than one half of the fall on the coast; but on this line, although crossed by a belt of forest, there are no mountain chains to intercept and lead to condensation of the vapour, and which is of course therefore rapidly absorbed by the dry and heated air of the province of Coimbatore on the east of the ghats.

There cannot perhaps be a more beautiful illustration of the effect of mountain chains, in arresting and condensing the vapour, than the generally luxuriant forests which clothe the eastern as well

as the western ghats, but which cease almost immediately on quitting those chains. The forests on the east coast as might be expected, are less lofty and luxuriant than those in Malabar, not only from the fall of rain on the east coast being only half that of Malabar, but also because they are in general double the distance from the sea, the chief source of all vapour.

There can of course be little question as to the effect forests must have during a great part of the year, in preventing the dissipation of the superficial moisture, but I should doubt if that circumstance can have much influence on the supply of water from springs. The effect of the sun's rays on the earth, even when fully exposed to them, is sensible to but a very inconsiderable depth from the surface, and not at all so far as the subsidence of the water forming springs. The copiousness of springs must be influenced so much by a variety of other causes, as to render the effect of forests hardly appreciable. The vicinity to elevated table lands and mountains and hills, the nature of the rocks, and inclination of the strata, the general slope of the country, the absorbent qualities of the soil, &c. &c. must all have the most important influence. At Trevandrum, even on eminences, the wells at a depth of 40 feet from the surface rise occasionally several feet with a fall of rain of only the same number of inches, and within two or three days after heavy falls.

In the forests of this coast and above the ghats in the western parts of Mysore, Wynaad, and Coorgh, the trees are I believe every where nearly destitute of leaves, during the early part of the year, the driest and the hottest season, so that, even in forest tracts, the earth is at that period exposed to nearly the full force of the sun's rays.

The long grass and low jungle is also generally burnt down in these months, and the general heat and dryness in passing through such tracts are frequently intolerable. The almost entire absence of moisture and springs in forest tracts in the dry season is well known.

The district of Ernaad in Malabar, formerly so celebrated for its teak forests, and still I believe with much forest of other kinds, is I believe for the most part a plain and nearly level, but in the hot season is like the other tracts, I have noticed, equally destitute of vegetation and moisture, and I speak of these facts from having, although many years ago, passed over all the tracts in question.

The forests in this quarter therefore, whatever beneficial effects they may have during the rains or cooler portions of the year, would seem to exercise but little influence on the general climate, or in the preservation of moisture, at the very season when it is most required.

If forests maintain a lower temperature during the day, they equally prevent direct radiation, and induce a higher temperature during the night, while they must always be pervious to the strong and dry winds that prevail during one season of the year.

The Ceded Districts, meaning thereby chiefly the Collectorate of Bellary, although in the very midst of the Peninsula, and its capital, at least, 200 miles from either coast, in a country also nearly destitute of forest tracts and mountain chains, and 1,600 feet above the sea, is hardly a drier climate, or with less rain than the province of Tinnevelly, which is hardly above ¼ the above distance from either coast, frontiered by the chain of ghats, and with more forest or jungle tracts, and not above 200 feet above the sea.

The average annual fall of rain at Bellary is about 20 inches, but has occasionally been as little as 8 or 10 inches.

The fall of rain at Bellary was in		
1822........24 inches.		At Palamcottah the average is........26 inches.
1823........ 7½ „		But in 1848 there was only about......15 „
1824........19½ „		
1828........24½ „		
1838........ 9½ „		

The fall of rain at Coimbatore was in

1845........23 inches.	1846 ....13½ inches.
1847.........34 „	1848.... ....19½ „

These two districts, to which may be added Coimbatore, appear to be, as far as regards the fall of rain, the driest perhaps under the Madras Presidency, or perhaps in any part of our Indian Empire, with exception of Scinde.

But small as is the fall of rain in the district of Bellary, the springs of water are I believe abundant, the slope of the country and the nature of the strata being favorable to their development. I recollect in the country about Raidroog, 40 miles South of Bellary, large holes were every where sunk from 25 to 30 feet deep, through the disintegrated and decomposed gneiss, where copious springs abounded, and carrying off channels from thence, the water was

brought (by the natural slope of the ground) to the surface within a few hundred yards, and fine streams obtained for irrigation even in the month of April. These springs were neither the result of forest tracts, nor of the condensation of vapours by elevated mountain chains, but had their origin in the mass of elevated land to the west of Raidroog which is some hundred feet higher, and some remarks on which, and the Soondoor mountains, I submitted to Government in my report of 21st October, 1846.

Dry and hot as the climate of Bellary has been considered, and disagreeable as it certainly is during the hot months of May and June, I do not observe such differences in the actual temperature, &c. as might perhaps have been supposed to exist.

From some observations made in the year 1824, I find the mean temperature to be in the month of:

	5 A. M.	3 P. M.	
April	76°	91½	hot season.
May	79°	93½	
While, at Madras, in June	81½	91½	hot season.
July	81½	91½	

The comparative low temperature with light westerly air at day-break at Bellary is, if I recollect correctly, a remarkable feature in its climate. It seemed to me to be caused by the strong sea breezes on the western coast at that season, and which reaching Darwar by the afternoon or evening, at the rate of 12 or 15 miles per hour, arrives at Bellary in the middle of the night or towards morning, where the rapid absorption of the vapour necessarily produces a fall of temperature.

I have traced the strong sea breezes of the Malabar coast nearly all across the Peninsula on different lines. At Seringapatam we used to look anxiously for its approach in the months of April and May, and where it generally arrived nearly as at Darwar about 8 or 9 P. M., causing an instant rise of several degrees on Saussure's hair hygrometer, and most agreeable to the feelings.

For instance in 1828:

		Temp.	Saussure's Hair Hygror.
17th March at	5½ P. M.	87°	7°
	9	84°	51°
14th May	5¼	88°	18°
	8¼	85°	54°

The arrival of the sea breezes from the Malabar coast may also be noticed occasionally at Bangalore, in the months of April and May, sometimes early in the night, but more generally towards morning.

Between Sedasheaghur and Mangalore the line of ghats is every where, I believe, of but moderate altitude, not probably any where above 2,000 feet, and without high chains of mountains, so that the sea breeze can pass over them at that season without any material obstruction, and to the influence of these moist breezes from the sea may possibly in part be ascribed the success of the cotton cultivation experiments to the west of Darwar.

These are points to which I have not observed that very much attention has been given, or at least few observations recorded. The temperature of the different seasons has been attended to, but not so much so I think the fall of rain, or the degree of humidity in the atmosphere. The climate of the southern or cotton districts of America, New Orleans and Florida, is noticed by Dr. Forry as remarkable for its equable temperature as well as its extreme humidity.

He says " This remarkable equality in the distribution of temperature among the seasons in Florida, compared with the other regions of the United States, constitutes its chief climatic peculiarity."

In regard to humidity, he adds :

" That the air is much more humid than in our more northern regions is sufficiently cognizable to the senses." The deposition of dew even in the winter is generally very great. To guard against the oxidation of metals " as for instance surgical instruments, is a matter of extreme difficulty. During the summer, books become covered with mould, and keys rust in one's pocket."

How different must be the climate of our Indian Cotton districts of Bellary, Coimbatore, and Tinnevelly.

The tables of rain in the foregoing papers are original, and the first I believe of their kind. They were set on foot, as I have already noticed, without the view of explaining any particular theory of climate. The extraordinary quantity of rain that fell on the high table land of the ghats near Trevandrum first drew my attention to the subject, and the theory of the condensation of the vapour caused by the mountain chains seemed to offer so perfect an explanation that I sought for no other. A farther investigation of the subject sug-

gested by the inquiries of the Honorable the Court of Directors, has not led me to attribute any very great influence to forests in the production of rain, but my remarks of course apply chiefly to the peculiar physical features of these two provinces of Travancore and Cochin, so remarkable from their great mountain barriers running parallel to the sea coast for 200 miles, intercepting the course of the monsoon, and no where above 40 miles distant, and the intermediate space towards the sea covered with innumerable high ridges and spurs from the main chain.

It will be observed from the letter of the Dewan of Cochin, that like myself he does not appear to have perfectly understood the meaning of the Court's queries as to how far the clearance of forests affected the moisture or productiveness of the soil. On inquiry I find that he merely contrasts cultivation under the shade of forest trees, with that on the same lands when cleared of forest. In the one case the growth of grain is rank and does not ripen, while in the other from the freshness and richness of the natural manure from decayed vegetable matter, it is vigorous and productive and in the same way that while the lands covered by forests are almost invariably wet and moist, after being cleared the moisture disappears.

These were results however, which few would question. My doubts were whether the Court adverted to the effect of extensive clearances on the lands previously under cultivation, to the general effect on the climate, on the fall of rain and on the original sub-stratum or sources of spring water, or whether it was meant to apply to the productiveness of the forest lands when recently cleared, compared with the productiveness of the same lands several years afterwards.

Of course from land cleared of dense forests the superficial moisture will be more speedily dissipated by evaporation, and when the same lands are brought under cultivation there must also be a corresponding local expenditure of water from the springs or rivers or other sources especially in warm climates.

This will lead probably to a partial and local (apparent) diminution of such sources of supply, but it can rarely I think materially affect a climate. The water that is evaporated, or absorbed by cultivation, will in the one case be ultimately restored to the land

by the periodical rains, and in the other will add by percolation to the supplies of lands on a lower level.

The wetness of the land said to be so remarkable in the extensive tracts of forests that cover a large portion of the interior of South America, I should be disposed to ascribe less to the obstruction offered by the abundance of decayed vegetable matter on the surface than to the want of slope in the soil to carry off the rain water.

The plains of the river Amazon at 3,000 miles from the Atlantic are stated by Humboldt to be not more than 1,200 feet above the sea, giving a slope of only $4\frac{3}{4}$ inches per mile in a direct line, and not probably half of that by the course of the rivers. In the south of India the slope will seldom I believe be found less than 4 or 5 feet per mile on a direct line.

I have the honor to be, &c.

RESIDENT'S OFFICE, *Cochin*, 31*st March*, 1849. W. CULLEN, M. G., *Resident.*

P. S.—About the same time that I received the order of the Government to prepare this report, I also received a similar communication from the Board of Revenue requesting my opinion on the question; and as I observe that the Government have entrusted to that Board the duty of drawing up a general report on the subject, I hope I shall merely have been anticipating the wishes of the Right Honorable the Governor in Council, in transmitting direct to that Board a copy of this communication.

Original Tables of the fall of Rain, by General CULLEN.

QUILON TO PALAMCOTTAH.

Miles	25	30	36	41	52	70
	Quilon.	Puttana-pooram. 150 Feet.	Shala-curray. 100 Feet.	Koraven-tavalum. 350 Feet.	Caldoorty. 750 Feet.	Shencot-tah. 600 Feet.	Palam-cottah. 150 Feet.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1844	60	102	113	115	123	24	$11\frac{1}{2}$
1845	62	83	88	112	114	43	$25\frac{1}{2}$
1846	$74\frac{1}{2}$	98	103	97	136	$41\frac{1}{2}$	18
1847	$83\frac{1}{2}$	132	123	134	158	70	47
1848	46	79	103	106	106	$32\frac{1}{3}$	15
Mean..	65	99	106	113	128	$42\frac{1}{2}$	24

	Alleppy to Cummum. Miles.... 31	50	60		Chowghat to Chittoor. Miles....14	12	52	
	Alleppy.	Thoda-wully. 120 Feet.	Perreyar river. 2500Feet.	Cum-mum. 3500Feet.	Cochin or Chow-ghat.	Shala-coody. 50 Feet.	Trichoor 50 Feet.	Chittoor 300 Feet.
1844	119	143	—	—	102	—	110	58
1845	98	133	81	42	93	91	115	61
1846	113	150	113	42	106	90	114	52
1847	131	172	—	—	125	87	112	77
1848	85	115	57	30	76	30	52	53
Mean..	109	142	84	38	88	72	101	60

	Cape Comorin. 63 Feet.	22 Uttree Mullay. 4600 Feet.	Trevan-drum. 120 Feet.
1844	19¼	—	47
1845	18	290	62
1846	56	236	69
1847	46	262	79
1848	24	209	41
Mean..	35	249	59½

W. CULLEN, *Resident.*

Copy of a Letter from the Dewan *of* Cochin.

No. $\frac{439}{1847}$.

To Major General W. Cullen, *British Resident of Travancore and Cochin.*

Sir,—I have the honor to acknowledge the receipt of your letter No. 1484, under date the 21st October last, with its enclosure (copy of a letter from the Secretary to the Government of India to the Secretary to Government Fort St. George, and also one from the Hon'ble the Court of Directors), and in reply to state, that it does not appear that there have been any such extensive clearances of forest in the Cochin country as to affect or influence the fall of rain.

Clearances, however, have taken place in different directions to a limited extent from one to four miles, and have been in every instance followed by decreased moisture and an increased productiveness in the soil.

I have the honor, &c.

(Signed) Shungra Warrier,
Dewan.

Huzzoor Cutcherry, Ernacolum, in Cochin, 8th December, 1847.

The letter from the Reverend Mr. Mault of Nagercoil, I have mislaid, but its purport was, that he was not of opinion, that any clearances of forest had taken place during his residence of near 30 years in the south of Travancore, to an extent that could in any way affect the climate—but he joined in the very general opinion, that forests promoted and preserved moisture.

W. CULLEN, *Resident.*

Extract from Minutes of Consultation.

Para. 1. The question at issue in the correspondence that has passed upon the subject is, whether " the clearing of extensive forest lands is not likely to cause a diminution in the quantity of rain and thereby a failure in the sources from which the springs are supplied." The report, which is otherwise important and interesting, does not appear to supply any specific data on these points, and although chiefly applicable to a peculiar region where rain is certain, it yet presents some anomalies as to quantities in the same parallels inland which do not appear to be accounted for. The Right Honorable the Governor in Council finds much valuable matter which may be turned to account by those taking an interest in the subject, and he resolves in pursuance of the intentions declared in Extract Minutes of Consultation, dated 8th September, 1848, No. 981, to have Major General Cullen's report printed and distributed in the same manner as the paper by Dr. Balfour, to induce those who have already written to lay before Government any further suggestions which may occur to them, as well as to enable those who have not so written, to avail themselves of the information it affords and mature their views.

2. As a copy of the Report is before the Board of Revenue, they will be requested to notice it with the other communications they may receive on the same subject.

3. The Governor in Council resolves to furnish to Major General Cullen a copy of the foregoing proceedings, and to convey to him at the same time the thanks of Government for his valuable and interesting communication.

A true extract.

H. C. MONTGOMERY, *Secretary to Govt.*

Report of Surgeon C. I. Smith, *of the Mysore Commission, on the effect of Trees on the Climate and Productiveness of a Country.*

To the Secretary to the Commissioner for the Government of the Territories of His Highness the Rajah of Mysore.

Sir,—I have the honor to forward for submission to the Commissioner, the following observations on the influence of trees in modifying and altering climate, and more especially in regard to the effect of their clearance in diminishing or otherwise the annual supply of rain.

In Mysore there has not been any clearance of wood to an extent sufficient to bear upon the question, and in the absence of meteorological observations in the jungly districts, we must avail ourselves of the only other mode of gaining information, viz., popular opinion. The superintendent of Coorg, in answer to a Circular from the Commissioner's Office, writes as follows: " They (the Coorgs) are fully impressed with the belief that to clear them (the jungles) extensively, would tend greatly to diminish the quantity of rain and of water in the rivers, and thereby destroy their paddy cultivation, the principal produce of Coorg, and also render the inhabitants less healthy,— thus it will be observed, that the general belief mentioned in the 3d para. of the Honorable Court's despatch, extends itself to the Coorgs."

The only part of Coorg that has been recently cleared is a small district on the west bank of the Cauvery, around Kooshalnuggur, for the purpose of establishing a cantonment for the corps of Sappers and Miners,—the influence of this small clearance on the falls of rain has not been remarked.

The opinion of the superintendent of Nuggur is, that the clearance of trees diminishes the quantity of rain,—speaking of the clearances and the destruction caused by coomri cultivation, he says " it causes the most rapid destruction of the forests, which, it is a well ascertained fact, lessens the quantity of rain and moisture, and must thus in the course of no very long time seriously affect the cultivation and prosperity of the country."

The superintendent of Chittledroog writes as follows: " There is not much scope for forming an opinion founded on experience and observation within the limits of this division as respects the influence of trees on rain; there are no forests or extensive jungles, or ranges

of high and wooded hills; there is, however, a difference in the features of Chittledroog or the northern division, and the Toomcoor or southern division of this district; there are very few large trees, and but limited garden cultivation on the Chittledroog side, while trees are numerous, and garden cultivation extensive on the Toomcoor side;—in the former locality, there are occasionally wet seasons, and heavy falls of rain, but the quantity of rain generally falls far short of the supply in the latter locality; in the absence of the data afforded by the clearing of a forest or the extensive cutting down of trees, or the restoration of such, it would be difficult to decide whether extensive garden cultivation and planting of trees has originated in, or produced, the more abundant supply of water; but I am inclined to adopt the latter conclusion."

The above extracts show that the opinions of the superintendents, and of the natives of this country, are in favor of the notion that the presence of trees in a country tends to increase the quantity of rain. One passage in the superintendent of Chittledroog's letter is worth notice, viz., that heavy falls of rain are frequent in the Chittledroog or northern part of his district. In that part of the country are barren ranges of granite hills, which, it is not unlikely, attract electric clouds accompanied by torrents of rain. The heaviest falls of rain in Mysore are in October and November during the north-east monsoon, and these showers are always accompanied by thunder and lightning.

On the 4th of October, 1846, an extraordinary storm of this sort broke over the hills to the north of Toomcoor, in the Chittledroog district, 10 inches of rain fell in 4 hours, and burst the bunds of nearly all the tanks over a range of 80 miles. The presence of trees appears in some way to modify these sudden bursts of rain and to equalize the falls, as similar thunder storms are common in the immediate neighbourhood of Seringapatam, where rocks are abundant and verdure scanty. The talooks in which most rain falls, apart from the hill country, are exactly those in which are the largest amount of jungle, Shemogah, Chennagherry, Terrikerry, and again down to the south in Heggadadavencottah and the talooks skirting the Coorg jungles and hill country, and then inland following the line of hills which runs from the Neilgherries and separates Mysore from Coimbatoor. In the Bangalore division, or eastern district of Mysore, the line of jungles from Severndroog to the Cauvery, including

the talooks of Closepett, Kankanhully, and Harohully, receive the most rain,—except these last named talooks in the Bangalore division, the others are all either bordering on lines of hills clothed with jungle or have extensive tracts of jungle which may fairly be supposed to influence the quantity of rain.

I have appended to this report a return showing the quantity of rain measured at particular spots in the four districts of Mysore for the last 12 years, a reference to which will show how little can be deduced from such varying results. The whole of the observations were taken in the open country. Rain gauges kept at a distance of 2 or 3 miles vary remarkably in the quantities measured, observations of this sort may, however, become valuable if taken for a series of years in different parts of India with similar instruments, as by comparing the quantities of rain measured in jungly and open districts, an approach may be made to some certain results.

In the Mulnaad and Coorg the quantity of rain that falls is very great, and to what can we attribute this, but to the influence of the ghauts and hilly country inland covered with dense jungles, which attract and retain the largest portion of the south-west monsoon. Bellary, Seringapatam, and Ootacamund are nearly in the same parallel of longitude, but at different distances from the line of ghauts, and to this circumstance we may attribute the difference in the falls of rain at these stations.

Assistant Surgeon Balfour, in his notes on this subject, has well remarked "that the observations of scientific men support the belief that a mutual reaction goes on between these two physical agents and that the presence of trees greatly adds to the supply of water and feeds the running streams." The instance of a single district losing its supply of water on being cleared of forest, and regaining it again when restored to its original state, would not alone establish more than strong presumption that the clearing of the forest and the loss of rain followed each other as cause and effect; but the Honorable Court of Directors, in their circular, mention that this is not uncommon in America.

On the subject of springs, Assistant Surgeon Balfour quotes from Jameson's Edinburgh Philosophical Journal, a very remarkable instance at Popayan in Peru, of a district losing its supply of water from the clearance of the forest. Two instances corroborative of the

above have come under my own observation, and happened to friends in different parts of the country engaged in coffee planting. The first happened in a range of hills south-east of Bangalore, at a coffee plantation now called Glenmore in the Debenaicottah talook of the Salem district. The proprietor when preparing ground for a coffee garden which was watered by an excellent spring, was warned by the natives not to clear away the trees in the immediate neighbourhood of his spring,—he disregarded their warning, cut down the trees and lost his stream of water. The other instance happened at the village of Hoolhully about eight miles distant from the head of the new ghaut in Mungerabad, I wrote to the gentleman to whom it occurred, who answered as follows : "The cutting down trees and clearing jungle on the sides of ravines in the close vicinity of springs, undoubtedly has a great effect in diminishing the quantity of water. I found it so in one or two instances in ravines I have cleared for planting—at one place where I had a nursery, which I used to water by turning a water course from the spring, I found that since I cleared up the sides of the ravine in which the spring is (for planting), I have not any thing like the quantity of water I had before the shade was cleared. I presume this is to be accounted for by the increased action of air and sun,—at any rate, the natives about here are of that opinion. I leave the cause, however, to be settled by more scientific men than myself,—that the effect is so, there is no doubt. A ravine close to the bungalow where there is a spring, a few years ago I cleared for planting, and found the water decrease in like manner; but the coffee trees dying away, and the place being too small for a plantation, I did not renew them, but allowed the jungle to grow up again, since which the stream has nearly regained its former size."

The superintendent of Nuggur writes "that springs of water shaded by trees almost invariably dry up, on the trees being cleared away. This has been observed on the Neilgherry hills and many other woody districts." In what way trees influence springs it is impossible to say; that they do so, seems to be established, as also that they condense and attract vapour.

I cannot omit inserting at length the quotation from White's History of Selborne, part of which is alluded to by Mr. Balfour. "In heavy fogs, on elevated situations especially, trees are perfect alembics; and no one that has not attended to such matters, can imagine

how much water one tree will distil in a night's time, by condensing the vapour, which trickles down the twigs and boughs, so as to make the ground below quite in a float. In Newton Lane, in October, 1675, on a misty day, a particular oak in leaf dropped so fast, that the cart way stood in puddles and the ruts ran with water, though the ground in general was dusty. In some of our smaller islands in the West Indies, if I mistake not, there are no springs or rivers, but the people are supplied with that necessary element, water, merely by the dripping of some large tall trees, which standing in the bosom of a mountain, keep their heads constantly enveloped with fogs and clouds, from which they dispense their kindly, never ceasing moisture; and so render those districts habitable by condensation alone. Trees in leaf have such a vast proportion more of surface than those that are naked, that in theory, their condensation should greatly exceed those that are stripped of their leaves, but as the former imbibe also a great quantity of moisture, it is difficult to say which drip most; but this I know, that deciduous trees that are entwined with much ivy, seem to distil the greatest quantity. Ivy leaves are smooth, and thick, and cold, and therefore condense very fast; and besides ever-greens imbibe very little. These facts may furnish the intelligent with hints concerning what sorts of trees they should plant round small ponds that they would wish to be perennial, and show them how advantageous some trees are in preference to others. Trees perspire profusely, condense largely, and check evaporation so much, that woods are always moist; no wonder, therefore, that they contribute much to pools and streams. That trees are great promoters of lakes and rivers, appears from a well known fact in North America; for since the woods and forests have been grubbed and cleared, all bodies of water are much diminished; so that some streams, that were very considerable a century ago, will not now drive a common mill. Besides most wood-lands, forests, and chases, with us, abound with pools and morasses, no doubt for the reason given above. Again, Dr. Hales in his vegetable statics, advances from experience, that the moister the earth is, the more dew falls on it in a night; and more than a double quantity of dew falls on a surface of water, than there does on an equal surface of moist earth. Hence we see that water, by its coolness, is enabled to assimilate to itself a larger quantity of moisture nightly by condensation,

and that the air when loaded with fogs and vapours and even with copious dews, can alone advance a considerable and never failing resource. Persons that are much abroad and travel early and late, such as shepherds, fishermen, &c. can tell what prodigious fogs prevail in the night on elevated downs, even in the hottest parts of summer, and how much the surfaces of things are drenched by those swimming vapours, though, to the senses, all the while, little moisture seems to fall."

In Coorg and the hill country, it is impossible to move off the road when walking early and before the sun has dried the ground, the dews are so heavy, and the dripping from the trees so wetting, yet the roads are perfectly dry. Some crops in India, as the cooltie, depend entirely on the fogs for sufficient moisture to mature a crop.

In paras. 31 and 32 of General Cullen's report, he says, "In the forests of this coast and above the ghauts in the western parts of Mysore, Wynaad and Coorg, the trees are I believe every where nearly destitute of leaves, during the early part of the year, the driest and the hottest season, so that even in forest tracts, the earth is at that period exposed to nearly the full force of the sun's rays."

"The long grass and low jungle is also generally burnt down in these months, and the general heat and dryness in passing through such tracts are frequently intolerable. The almost entire absence of moisture and springs in forest tracts in the dry season is well known."

And at para. 34 he says, "The forests in this quarter therefore, whatever beneficial effects they may have during the rains or cooler portions of the year, would seem to exercise but little influence on the general climate, or in the preservation of moisture, at the very season when it is most required." General Cullen's recollection of these tracts is not in accordance with my experience of them. I was in the north of Coorg in December last and in Munzerabad in January of this year, and in January, 1847, it is true that the grass is generally fired, but very few of the trees are deciduous and even at that dry season of the year most of the deciduous trees were in full blossom, and preparing to throw out their spring crop of leaves. It is in the hottest season of the year, March and April, that the mangoe throws out its blossoms and young leaves, maturing its fruit in June; from what source does it derive the requisite moisture, to carry on the process of maturing its crop? In the months I

have mentioned, and in the districts in question, it was impossible to move off the roads till the sun had dried up the dew with which the grass and brushwood in the jungles was daily saturated. On the Baba Booden hills in April, 1848, the hottest season of the year, I found the fog so dense till 8 or 9 A. M. and the condensation of water on the trees in the jungles so great, that I used to be wet through in moving through them.

About 37 miles north of Bangalore is the range of hills of which Nundydroog forms the most conspicuous object; some friends encamped at the foot of these hills, were at a loss to account for the circumstance that Nundydroog was often clear of vapour, when two other hills close to it were covered with a cloud, nor were they able to account for it, till on ascending these hills, they were found to be covered with a stunted vegetation, from which Nundydroog was free. When encamped on Nundydroog, I observed rain frequently fall on those opposite hills, apparently avoiding the one on which I was. Doctor Darwin supposes that as the summits of mountains are much colder than the plains in their vicinity, they condense the vapours more readily, and so contribute to form springs; supposing Dr. Darwin's theory to be true, which I have no doubt it is, the condensation produced by the cold top of Nundydroog actually higher than the neighbouring hills, was more than counterbalanced by the circumstance of the others being clothed with verdure. The presence of springs near the top of insulated granite hills as Nundydroog, Sivagunga, Severndroog, and in fact on most of the insulated hills in Mysore, is not easily accounted for. These hills are insulated and rise out of the plain from 15 to 1800 feet, the base surrounded with blocks of granite. It is difficult to suppose that the causes we have been enumerating as influencing springs, can have any perceptible effect on those which are found under the lower strata, in Bangalore as deep as 50 feet,—for the sources which supply these, we must look to other causes.

I have the honor to be, &c.

BANGALORE, 23d *June*, 1849.

(Signed) C. I. SMITH, Surgeon,
Mysore Commission.

(True copy.)

M. CUBBON,
Commissioner.

Abstract of the monthly fall of Rain at Bangalore, from the year 1837 *to* 1848.

Months.	1837.		1838.		1839.		1840.		1841.		1842.	
	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.
January,	......	..	......	..	·55	3	.....	..	....	....	.....	3
February,	.....	..	......	..	......	..	......	..	....	....	.....	..
March,	$\frac{3}{16}$	1	·45	1	·10	2	·20	2	1 slight	shower	.....	1
April,	$1\frac{5}{16}$	2	·75	8	·85	4	·80	6	1·90	3	·6	4
May,	$5\frac{5}{16}$	13	2·70	8	6·95	9	7·65	13	2·95	10	2·20	9
June,	$3\frac{15}{16}$	13	1·85	7	3·75	8	2·40	8	1·90	10	8·25	10
July,	$4\frac{4}{16}$	14	drizzle	9	4·80	21	3·60	10	2·65	10	1·25	4
August,	$6\frac{6}{16}$	18	4·5	10	7·20	19	5·35	7	10·35	18	2·61	12
September,	$1\frac{14}{16}$	7	3·40	8	4·10	14	5·40	10	8·90	16	10·50	15
October,	$10\frac{2}{16}$	13	1·15	6	3·85	9	4·50	12	8·0	16	5·40	6
November,	$10\frac{7}{16}$	15	1·10	5	.....	3	·30	5	1·30	4	·45	3
December,	$1\frac{5}{16}$	2	......	1	·15	1	......	..	....	.....	.....	..
	$45\frac{3}{16}$	98	15·45	63	29·30	93	30·20	73	38·5	87	30·72	67

Months.	1843.		1844.		1845.		1846.		1847.		1848.	
	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.
January,	1·75	3	.....	1	2·95	3	......	..	......	..	....	..
February,	.....	..	·35	2	......	..	·15	1	1·60	4	.....	..
March,	1·60	6	·70	2	·45	4	.....	..	.....	1	....	..
April,	.....	..	·15	5	2·75	8	·5	1	·85	5	2·65	8
May,	8·0	8	4·5	9	1·95	8	8·40	11	3·75	15	7·92	10
June,	3·45	10	1·40	7	7·30	12	1·85	12	1·20	8	1·70	12
July,	1·80	4	3·10	9	2·5	4	4·50	17	11·35	19	5·16	16
August,	1·30	8	3·55	13	1·80	8	3·10	20	4·5	15	7·25	19
September,	6·15	11	6·70	9	9·5	10	7·0	12	3·50	3	11.50	13
October,	7·10	16	3·45	6	2·80	3	10·75	13	9·30	14	2·15	4
November,	.....	..	.....	..	·30	2	2·90	4	1·55	7	1·40	4
December,	5·45	7	4·45	10	·50	2	·75	2	·85	3	·50	4
	38·60	73	27·90	73	31·90	62	39·45	93	37	94	40·3	90

Register kept in the Cantonment of Bangalore.

Abstract of the monthly fall of Rain in the Nuggur Division, from the year 1837 *to* 1848.

Months.	1837.		1838.		1839.		1840.		1841.		1842.	
	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.
January,	......	..	......	..	......	..	......	..	......	..	......	..
February,	......	1	......	1	......	..	......	..	......	..	......	..
March,	......	7	....	2	......	..	......	2	....	..	......	..
April,	$\frac{5}{16}$	2	$2\frac{1}{4}$	6	$3\frac{3}{8}$	5	$1\frac{1}{3}$	10	......	7	$\frac{1}{2}$	1
May,	$3\frac{3}{16}$	7	$1\frac{13}{16}$	8	$3\frac{7}{16}$	8	$2\frac{1}{4}$	4	$3\frac{5}{10}$	4	$2\frac{1}{4}$	2
June,	$1\frac{1}{8}$	8	$1\frac{15}{16}$	11	$1\frac{12}{16}$	9	$5\frac{9}{16}$	8	$2\frac{9}{16}$	3	$6\frac{15}{16}$	9
July,	$2\frac{7}{16}$	12	$2\frac{1}{4}$	11	$7\frac{1}{4}$	24	9-6/5	15	$3\frac{3}{16}$	6	$7\frac{9}{16}$	17
August,	$3\frac{3}{16}$	17	$2\frac{15}{16}$	13	$4\frac{3}{16}$	17	$\frac{10}{16}$	4	$3\frac{7}{16}$	9	$3\frac{12}{16}$	7
September,	$6\frac{1}{8}$	13	$2\frac{1}{8}$	10	$3\frac{1}{16}$	7	$\frac{1}{2}$	2	$\frac{12}{16}$	6	$8\frac{1}{8}$	10
October,	5	11	$1\frac{3}{8}$	5	$5\frac{11}{16}$	7	$3\frac{10}{16}$	7	$10\frac{3}{16}$	14	$\frac{1}{2}$	1
November,	$8\frac{1}{2}$	15	$1\frac{13}{16}$	7	$1\frac{7}{8}$	1	......	..	$1\frac{1}{16}$	1	......	..
December,	$1\frac{9}{16}$	1	......	..	......	3	......	..	......	..	......	..
	$32\frac{1}{16}$	94	$15\frac{14}{16}$	74	$29\frac{11}{16}$	81	$23\frac{1}{16}$	52	$24\frac{11}{16}$	50	290	47

Months.	1843.		1844.		1845.		1846.		1847.		1848.	
	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.	Rain Gauge.	No. of days in each Month.
January,	......	..	......	..	·15	1	......	..	......	..	......	...
February,	......	.	......	..	......	.	·70	2	3·80	6	......	...
March,	......	...	......	..	·51	3	......	..	·35	2	......	...
April,	$3\frac{1}{4}$	7	·15	1	3·50	6	·10	1	3·35	4	3·40	9
May,	......	..	2·10	5	·20	1	1·70	5	7·15	9	5·75	16
June,	......	..	4·64	15	5·15	16	5·35	15	1·55	5	2·65	10
July,	1·65	15	6·41	24	5·10	8	8·48	20	1·75	8	5·5	12
August,	·51	4	4·4	16	2·50	14	4·60	19	·85	7	8·15	13
September,	4·50	11	5·55	8	5·65	10	1·55	9	·80	4	1·70	9
October,	5·45	9	5·35	9	·30	3	8·50	12	8·30	15	2·40	7
November,	......	..	......	..	2·0	2	1·5	1	3·5	4	·75	3
December,	......	..	2·0	6	·90	2	·20	1	......	..	......	..
	15·36	46	30·64	84	25·96	66	32·3	85	30·95	64	29·85	79

Register kept at the Town of Shemogah, except during the five months when the Cutcherry is on Jummabundy.

Abstract of the monthly fall of Rain in the Chittledroog Division, from the year 1837 *to* 1848.

Months.	1837. Rain Gauge.	1837. No. of days in each Month.	1838. Rain Gauge.	1838. No. of days in each Month.	1839. Rain Gauge.	1839. No. of days in each Month.	1840. Rain Gauge.	1840. No. of days in each Month.	1841. Rain Gauge.	1841. No. of days in each Month.	1842. Rain Gauge.	1842. No. of days in each Month.
January,	......	..	......	..	......	..	......	..	......	..	......	..
February,	......	..	......	..	$\frac{3}{8}$	1	......	..	......	..	......	..
March,	......	..	......	..	$\frac{1}{8}$	1	......	..	·62	1	·45	1
April,	......	1	$1\frac{7}{16}$	4	$3\frac{1}{4}$	3	$2\frac{1}{2}$	1	1·12	3	·80	2
May,	$4\frac{1}{8}$	7	$1\frac{7}{8}$	3	$3\frac{7}{8}$	6	$1\frac{15}{16}$	5	2·70	3	3·55	7
June,	$1\frac{9}{16}$	1	$1\frac{3}{8}$	1	$4\frac{7}{16}$	9	$2\frac{1}{8}$	6	3·55	9	4·65	6
July,	$2\frac{13}{16}$	5	$\frac{5}{16}$	2	20	7	$\frac{7}{16}$	3	·65	2	2·55	8
August,	$3\frac{3}{16}$	10	$2\frac{3}{16}$	8	$5\frac{15}{16}$	13	$1\frac{5}{8}$	5	4·35	11	3·10	7
September,	1[illegible]	5	$4\frac{5}{16}$	6	$8\frac{3}{8}$	11	$7\frac{7}{8}$	8	7·15	8	8·65	12
October,	$4\frac{3}{16}$	5	$2\frac{3}{8}$	3	$3\frac{3}{4}$	6	$5\frac{5}{8}$	9	8·60	17	3·55	3
November,	$9\frac{7}{8}$	11	$\frac{8}{16}$	1	$\frac{7}{16}$	3	$\frac{1}{16}$	1	·40	2	......	..
December,	......	..	......	..	$\frac{1}{8}$	1	......	..	......	..	......	..
	$26\frac{10}{16}$	45	$12\frac{1}{16}$	28	$32\frac{9}{16}$	61	$21\frac{11}{16}$	37	29·14	56	27·30	46

Months.	1843. Rain Gauge.	1843. No. of days in each Month.	1844. Rain Gauge.	1844. No. of days in each Month.	1845. Rain Gauge.	1845. No. of days in each Month.	1846. Rain Gauge.	1846. No. of days in each Month.	1847. Rain Gauge.	1847. No. of days in each Month.	1848. Rain Gauge.	1848. No. of days in each Month.
January,	......	...	......	..	·40	1	......	..	......	..	......	..
February,	......	...	......	..	......	..	......	..	3·50	5	......	..
March,	......	...	......	..	·30	2	......	..	......	..	......	..
April,	·95	4	1·30	4	1·10	3	·20	2	2·15	3	1·95	4
May,	8·30	9	4·30	8	4·0	7	8·30	7	5·95	6	7·5	7
June,	2·80	3	3·85	10	5·40	11	4·0	7	·40	1	·85	3
July,	1·45	2	3·75	9	·25	1	10·20	9	5·55	6	1·25	5
August,	2·20	4	1·5	3	·55	1	1·55	5	1·50	4	·65	1
September,	6·55	9	3·20	6	13·20	7	6·55	4	1·85	1	2·25	6
October,	18·10	17	5·40	5	·95	1	23·70	9	9·45	14	1·45	2
November,	......	..	......	..	·25	1	1·45	2	1·35	2	1·50	1
December,	1·75	4	2·50	5	......	..	·90	1	......	..	......	..
	42·10	52	25·35	50	26·40	35	56·95	46	31·70	42	16·95	29

Register kept *chiefly* at the Town of Toomcoor the Southern part of the District.

Abstract of the monthly fall of Rain in the Astagram Division, from the year 1837 *to* 1848.

Month.	1837. Rain Gauge.	1837. No. of days in each Month.	1838. Rain Gauge.	1838. No. of days in each Month.	1839. Rain Gauge.	1839. No. of days in each Month.	1840. Rain Gauge.	1840. No. of days in each Month.	1841. Rain Gauge.	1841. No. of days in each Month.	1842. Rain Gauge.	1842. No. of days in each Month.
January,	......	..	......	...	....	...	....	...	....	...	....	...
February,	......	..	....	...	....	...	....	...	....	...	1·25	2
March,	$\frac{1}{16}$	3	$2\frac{5}{8}$	2	....	3	....	...	....	...	....	...
April,	$\frac{14}{16}$	4	$3\frac{3}{8}$	5	....	5	....	...	$1\frac{1}{8}$	3	·37	1
May,	$3\frac{12}{16}$	9	....	11	....	9	$3\frac{5}{8}$	11	$4\frac{1}{16}$	7	2·90	8
June,	$2\frac{1}{16}$	5	$\frac{1}{16}$	1	....	5	$2\frac{1}{8}$	5	2	2	$4\frac{1}{8}$	8
July,	$\frac{10}{16}$	4	$\frac{3}{16}$	3	$\frac{1}{16}$	18	$1\frac{3}{8}$	9	$\frac{4}{16}$	3	$\frac{12}{16}$	5
August,	3	5	$\frac{7}{8}$	6	$1\frac{5}{8}$	10	$\frac{3}{8}$	3	$3\frac{1}{2}$	6	$3\frac{1}{2}$	9
September,	$3\frac{9}{16}$	8	$7\frac{5}{16}$	12	$3\frac{3}{16}$	11	$\frac{5}{16}$	2	$11\frac{7}{8}$	8	$3\frac{1}{2}$	7
October,	$5\frac{8}{16}$	10	$3\frac{1}{4}$	6	$5\frac{4}{16}$	11	$5\frac{3}{16}$	9	$7\frac{5}{8}$	10	$7\frac{1}{2}$	6
November,	$6\frac{1}{16}$	7	$1\frac{13}{16}$	4	$\frac{9}{16}$	4	$2\frac{7}{16}$	3	$2\frac{1}{8}$	3	....	...
December,	......	..	$\frac{3}{6}$	1	....	...	....	...	....	...	....	...
	$25\frac{[illegible]}{16}$	55	$19\frac{11}{16}$	51	$9\frac{11}{16}$	76	$15\frac{7}{16}$	42	$31\frac{7}{8}$	42	23·89	46

Month.	1843. Rain Gauge.	1843. No. of days in each Month.	1844. Rain Gauge.	1844. No. of days in each Month.	1845. Rain Gauge.	1845. No. of days in each Month.	1846. Rain Gauge.	1846. No. of days in each Month.	1847. Rain Gauge.	1847. No. of days in each Month.	1848. Rain Gauge.	1848. No. of days in each Month.
January,	....	...	·10	1	1·3	3	....	...	....	...	....	...
February,	....	...	·15	1	·15	1	....	...	·30	1	....	...
March,	....	...	....	...	3·10	3	....	...	·15	1	....	...
April,	....	8	2·65	4	7·20	11	1·35	2	1·85	4	4·70	6
May,	2·25	8	9·35	11	10·75	9	4·35	8	5·90	10	4·55	8
June,	3·95	6	5·50	7	1·40	6	·25	9	·75	3	·45	2
July,	·90	3	2·90	7	·25	2	4·95	9	1·90	8	1·0	3
August,	2·0	5	1·35	5	·75	4	2·70	7	·45	2	2·55	6
September,	3·40	9	4·30	7	4·50	11	1·15	4	·55	3	8·25	16
October,	8·95	11	1·95	3	4·70	7	11·10	13	10·5	16	3·20	7
November,	....	...	·40	1	·40	1	1·55	3	1·50	8	2·20	7
December,	1·10	2	5·80	6	....	...	·5	1	1·45	4	....	..
	22·55	52	34·45	53	34·20	58	27·45	56	24·85	60	26·90	55

Register kept at the Town of Mysore, unless when the Cutcherry is on Jummabundy.

(Signed) C. I. SMITH, *Surgeon.*

(True copy.)

M. CUBBON, *Commissioner.*

III. *On the Cultivation of the Hurriallee Grass. Communicated by Colonel* Reid, C. B., *Secretary to the Agri-Horticultural Society.*

For the following valuable paper, on the cultivation of the "Hurriallee Grass," we are indebted to Major Ottley, Fort Adjutant at Vellore, on application being made to him, by the Agri-Horticultural Society of Madras, to assist them in meeting the wishes of Government, on behalf of Her Majesty's Colonial Government of Ceylon, to procure and forward (with the eventual view of transmitting from thence a portion for introduction into Her Majesty's Colonies of the Cape, New South Wales, &c.) either seeds, or roots of the grass, known at Madras as the "Dhoob" or "Hurriallee," and on which our horses are almost entirely foraged.

The grass in question is the *Panicum Dactylon*, of Roxburgh; *Agrostis, linearis* of Linnœus; Telinga, *Ghericha;* Tamil, *Arugum Pilla*, and Hindoostanee, *Dhoob*. It is unquestionably the most valuable grass India possesses for forage, but its capabilities, as a hay grass, though partially known for years; have not been fully developed, until lately.

The grass, in its natural state (and it may be seen most commonly on every road-side) partakes of the character called creeping, the flower bearing branchlets alone, being erect, and these rarely arriving at a foot in height, and by no means abundant. It is to cultivation, therefore, that we owe its becoming a hay grass, and Major Ottley's paper shows to what perfection it can be brought; the grass, in favourite places in his ground, grows to the extraordinary height of from 3 to 4 feet and averages 2 feet throughout. The crops are so luxuriant that the space, on which the grass is grown, is not sufficiently large to work it on in the drying,—the lower part of the stalks being one complete entangled mass. The growth is so rapid, that, if requisite, nearly monthly crops could be taken, each acre producing a ton at a bearing, and each ton worth 30 rupees at least.

One of the most remarkable qualities of this grass, and, to us, certainly, one of the most valuable, is the fact of its rejoicing in the heat, the very best crops are produced in the hottest weather, and there can be no doubt, but that the hay of such crops will be sweeter and of a more nourishing quality, from the combined effects of the sun and

irrigation, than crops produced almost solely from the effects of the monsoon, without so much of the congenial warmth and ripening properties of the sun. It has occurred to me that a still more ready mode of cultivation than either of those mentioned might be adopted, viz., with the common country plough, let the planter follow immediately on the plough, and lay the roots lengthways in the furrow, the next plough buries the roots and makes a new furrow, which is again planted by a man following and so on, any number of ploughs and planters may be employed according to the expedition required, and the size of the ground; care should be taken to eradicate at an early stage any other description of grass or weed that may appear, and for this purpose the crop should frequently be carefully examined throughout. If weedy grasses should, in spite of every care, spring up, and be only discovered when in seed, remove the spikes carefully, and by so doing, you will at all events prevent their increase by seed, and can eradicate the plants thereafter in their early stage of sprouting.

It may here be added with regard to the success of the application to Major Ottley for seed, that by the last steamer two large bales of seed, in the ear, were forwarded to Ceylon, being the produce of Major Ottley's grass fields at Vellore and kindly forwarded by that Gentleman to Madras for the use of the Agri-Horticultural Society.

F. A. Reid,
Secretary.

Agri-Horticultural Society's Gardens, 22*d October*, 1849.

Vellore, 17*th July*, 1849.

I should be most happy to comply with your requisition for Hurriallee Grass seed, were it possible to obtain any: a crop of grass must be raised in the first instance, and when full ripe a collection of tops will furnish the requisite, and this shall be attended to, as soon as possible with great pleasure. No one in Vellore besides myself has ever attempted its cultivation, and for three years I had little success, although the ground was dug, cleaned, and manured to the fullest extent from pits 20 feet square and five feet deep of cow dung at least a year old, and all the watering was to little purpose, for it never exceeded six or eight inches in height; at the recommenda-

tion of a native I mixed potash to loosen the soil but it had the effect of destroying the roots, and to remedy this, I covered the whole surface with about 9 inches of light sandy stuff called wundul taken from the bottom of tanks adding to it plenty of dung, I planted again and the result was most favourable. Rice land is clayey and after irrigating cracks and is more or less one sheet of sun burnt brick, which precludes the roots from bifurcating, or shoots to spring up ; the condition of my ground will be best shown by a return of 8 crops last year of as fine hay as can be produced in any part of the world, averaging one ton a cawny, you have only to give me 30 days Law any month in the hot season, to furnish a specimen to the extent of 4 tons. I find the roots after a year get so thick and matted, that the grass cannot grow more than a foot, in fact the upper surface can only be compared to a coir rug, when this is the case it takes three days ploughing to get rid of the superfluous roots, and although one would fancy from the cart loads taken out that few roots would be left, still in about 10 days with a good flourish of manure which is thrown previous to the last ploughing, it will be found after levelling, ridges prepared 6 feet apart, and watering by the pecottah, that the plot is as green as ever, furnishing a good return, but still better the second cutting. The dry weather is more favourable to crops than the monsoons, too much wet is bad, and produces frequently myriads of caterpillars that devour all but the stem in a night or two. I only water twice, seed will answer very well but roots of a proper description throw you almost a year in advance of them. I attempted three modes of planting, first dibbling, sticking the roots up and down ; but this was too slow a process, so inundated the ground like a paddy field, and stuck them into the mud but neither plan answers so well as making long furrows with a mamoty three or four inches deep and laying the whole root in lengthways, for then every joint or knot throws out a shoot, and covering them prepares another trench so that two men cut along at a great rate, the principal part of my ground was really good for nothing and took 12 to 14 men a year to dig and clean an acre, for it was full of those horrible knotty weeds that have long fibres under ground called " Cangoo." I then dug a number of holes 2 feet deep, 4 in diameter, 5 feet apart and put into each 2 cart loads of fresh cowdung, and covered them with *wundul* and old manure, and, when the surface was all properly prepared, planted : and I found that the grass that grew over the

pits to be most luxuriant, when other parts seemed bare in comparison; although the produce throughout was splendid, this shows that the richer the soil, the better the crop. Quicklime as a manure is admirable stuff, in proof of which I deposited a cart load on the grass and threw a bamboo mat over it, in the course of three weeks the grass grew through the lime and mat, and it was with force alone it could be removed. Another experiment was to strew straw over a bed that had been watered for the last time, and the grass rose much higher than in parts where it was not applied.

A six dozen case would be a good mode of conveying fine, long, juicy hurriallee roots, first strew some fine fresh soil about $\frac{1}{2}$ an inch thick at the bottom and then deposit a layer of roots and then a sprinkling of earth and so on. I will answer for it they will be fresh after a considerable time if only kept damp.

In May and June I had excellent cuttings and the compound is now like a sheet of Paddy, and if you would like to send Lord Torrington a specimen, of what's now on the ground a bandy load shall be despatched to your address which you can get trussed at Parry and Co., and sent off by the Steamer—no other description of grass is allowed to show its head in my place. I take no pains to grow more than is wanted for my stud, nevertheless I can accommodate my friends with a little. From what I have offered it will be observed that it is quite useless attempting to cultivate this kind of grass, except in deep, rich, loose mellow soil, I manure from large pits that are always kept filled with cow dung and the tops covered with light earth to prevent evaporation of chemical properties. This is mixed yearly with wundul, lime and a sprinkling of salt, and a good layer is spread over the plots and ploughed in as before stated, all this expense is thrown away without you have capacious wells at convenient positions, say, for an acre and a half, to irrigate beds that must be nicely prepared, 6 feet broad and 30 long, with a gentle slope, so that the water may flow over them quickly; larger beds are only to ensure loss of time, labor and water, and this bit of information was taught at a considerable cost, having had to diminish the size of all the partitions, three different times, for, I found it took all day to water the most trifling space, and, by the means suggested, half an acre can be flooded with a pecottah and pair of bullocks in 8 hours. The Bangalore hay is a mélange of all sorts, and I will back my com-

pound against any in Mysore for quality, quantity and length of produce, at any season of the year, as I believe no man in India has ever taken the same pains to bring this particular grass to perfection, and that for a period of five years. It is no doubt a description of couch grass, for it is equally difficult to extirpate, and the roots are generally found a foot from the surface, and the smallest particle left in the ground will shoot up. I return the several papers and am only sorry I have not had time to consider the subject in the manner I should wish, so excuse this hasty reply.

(Signed) C. G. OTTLEY.

IV. *Statistics of the Circar of Dowlutabad. By Surgeon* W. H. BRADLEY, *8th Regiment Nizam's Infantry.*

Area.

The Circar of Dowlutabad is an extensive district in the province of Aurungabad, averaging 60 miles in length and 50 miles in breadth. It is situated between the 19th and 21st degrees of northern latitude, on an extent of hill and plain bounded north by Kandesh, east by Beytelbarree and Jaulnah, south by Peytun, and west by the Ahmednuggur districts, the windings of the Godavery marking its limits upon the south-west. According to Arrowsmith's map, its area may be roughly estimated at about 2,900 square British miles, which, reckoning the population at 1,94,767 inclusive of that within the city of Aurungabad, gives 67 souls to the square mile.

Geological Structure.

The geological features of the whole district are simple and unvaried, forming as it does an integrant portion of the great trap formation of central India, the leading characteristics of which are all present.

The prevailing rocks throughout appear to be a clay stone porphyry or amygdaloid through which basalt is disposed either stratiformly in horizontal masses, or as instrusive veins and dykes; in all instances assuming a crystalline form which has conformed to the circumstances under which it had been ejected, and is either columnar, spheroidal, vesicular or amygdaloidal; these varieties are frequently observed passing into each other by such insensible gradations that it becomes almost impossible to assign distinct characters to the rocks so circumstanced.

A series of narrow ranges traverse the Circar in a direction almost east and west, their greatest height above the plains not exceeding seven hundred feet. All displaying in a marked manner, the peculiar streaked appearance noticed as so remarkable a feature in the Vindhya Range ; and, according as the rock that caps them happens to be composed of the hard or softer varieties of trap, so are their summits tabular or rounded.

The chain of hills upon the south have no particular name assigned them, but appear to be prolongations of the Sichel range; those upon the north are continuations of the Balla Ghat or southern boundary of the Berar valley; that portion within the Circar being known either as the Gowtala or Ajunta Ghats: this barrier presents steep and precipitous sides towards the low country of Kandesh, affording in a few instances difficult passage for wheeled carriages, through narrow rugged passes. The lofty peaks and projecting spurs along this range present several striking examples of the natural defences of a mountain fastness.

An enumeration of the principal rocky masses and minerals met within the district is here given.

1. Basalt occurring columnar in horizontal masses, the columns large, irregular and perpendicular to their planes ; texture close grained, of a dark greyish color internally, whilst the surface is of a reddish or a pale buff color. When the basalt occurs in dykes, the rock is disposed in prisms with vertical segments of small dimensions and very compact texture, generally showing purple stains in the fracture.

2. Basalt of a compact nature whose structure is globular, and on decomposing exposes a series of spherical coatings, small crystals of olivine are plentifully disseminated throughout.

3. Basalt of an earthy fracture, very close texture, dark color, tough, and unyielding under the hammer.

4. Phonolite another compact variety of basalt of a greyish color, fissile and ringing with a metallic sound when struck, cleaving readily into convenient forms, it is in request for building purposes.

5. Wacke or Indurated clay. This rock is met with in every degree of induration and forms the vehicle for the greater portion of imbedded minerals found in the district.

6. Amygdaloid Trap. The basis of this rock is wacke variously coloured from grey to buff having shades of light green and pink with every gradation of hardness : it is seen interposed between darker basaltic strata the association with which gives the streaked appearance to the bared sides of the mountains. Numerous silicious minerals are scattered throughout the rock of all forms and sizes; oftentimes irregular cavities of large dimensions are seen, whose sides are lined with calcareous spar, rose and rock crystals, and cachalong.

7. Red Amygdaloid Clay Stone. This rock is very frequent along the lower basis of the hills, its color varying from a pinkish hue to a bright brickdust red, and chocolate, it contains cavities occupied with shining zeolitic spar, or tabular and flattened chalcedonic minerals, coated with chlorite earth. It is not unusual to find the cavities empty and their sides covered with earth of a deep yellow or light green color.

8. Red Clay Stone Porphyry. A rock with sharp fracture and inclined to a fissile character. Its imbedded minerals are zeolite and silicious crystals generally in small rounded forms ; sometimes the contained minerals blend into the general mass, as specks or splashes, or by their infrequent occurrence confers the condition approaching to a simple rock. It is susceptible of a high polish and is admirably adapted for ornamental architectural purposes.

9. Ferruginous Clay Stone. This is the Ferruginous clay stone of Dr. Maculloch, and to be distinguished from the rock so termed by Dr. Buchanan, which is laterite. It is generally of a purplish grey color within, coated without with a brickdust or livid red ; usually seen under semi-columnar basalt, and reposing on globular trap rocks, varying in breadth from six or eight inches in two or three feet. Its structure is best observed in the beds of nullas, or passes in the hills where it may be seen taking a waving line as *if* adapting *itself* to the inequalities of the rock it reposes on ; where its surface is exposed (which is reddened) there are seen what at first sight has much the appearance of ripple marks being slight ridges or elevations arranged in semi-circular sweeps in an uniform manner, which project at their centre, as if produced by the force of some impulsive power, and terminate in a thin rounded margin, a series of circular elevations are sometimes seen as though a viscid mass, in flow-

ing tardily onwards, had met with some obstruction, and hardened in the act of receding from the obstacle. Very remarkable fistulous cavities are seen in this rock filled with zeolitic or calcareous spar, or having merely the sides coated with green earth. These tabular bodies are all observed to be disposed at right angles to the surface of the rock they are imbedded in.

10. Earthy Clay Stone. An ochreous bed of red earthy clay stone, if often seen lying under, and upon, the same description of rocks as the preceding variety, is associated with and is apparently the same rock modified by circumstances : its breadth is the same, but is generally found as a soft earth, occasionally passing into a rock resembling earthy jasper : when in its soft condition it separates into vertical masses with a conchoidal fracture, flying into numerous fragments from the slightest blow of the hammer.

11. Earthy Lime Stone. A rock abounding in the amygdaloid wacke strata, occupying veins and seams and particularly plentiful towards the lower portions of the hills.

12. Calcareous Tuff. Very extensive formations of this substance are met with occupying beds of various depths along the lower levels of the valleys, and near the base of the hills, often assuming the character of a semi-crystalline body.

13. Jasper. This mineral occurs in large beds amongst the amygdaloid wacke, assuming various shades of green, yellow, red, and black, the blending together of which in spots and veins; gives the rock a truly splendid appearance, its edges are translucent, with the exception of the black varieties. Heliotrope occurs also in great abundance.

The following minerals are those principally found in the amygdaloid beds.

EARTHY MINERALS.

Silica.—Rose Quartz,	Red and white Cornelian,
Milk Quartz,	Agate,
Rock Quartz,	Moss Agate,
Amethystine Quartz,	Onyx,
Semi Opal,	Jasper,
Chalcedony,	Henlandite,
Heliotrope,	Stilbite,
Cachalong,	Hornblende,
Hornstone,	Augite.

Magnesia.—Olivine.
Potash.—Felspar,
Chlorite.
Soda.—Mesotype.
Acidiferous Alkaline Mineral.—Nitrate of Potash.

Acidiferous Earthy Mineral.—Carbonate of Lime,
Calcareous Spar,
Opaque Green Calcareous Spar,
Calc Tuff.

A few general remarks will close this brief sketch of the chief rocks and minerals of the Circar.

The Basalt of the range is much mixed up with Olivine and Felspar, the presence of the latter causing the rock to disintegrate, and become a very unfit material for building, as may be witnessed in the crumbling walls and tombs around Aurungabad and Rauzah.

The purple Amygdaloid rock is the characteristic one of the lower levels, and in it are to be found the cave temples of Ellora and Aurungabad.

Basaltic dykes abound throughout the Amygdaloid trap, varying in thickness from a few inches, to twenty and upwards. Unlike the dykes of Great Britain and Ireland, they do not appear to have occasioned the slightest disturbance of the strata they have passed through: around Aurungabad several striking instances of these dykes are to be met with; at one place in particular on the road to Dowlutabad where the wall-like appearance, and prismatic structure of the rock is distinctly disclosed by having been cut through for the high road to pass. It is observed to leave the range at about two-thirds its way up, forms a sloping shoulder to the hill and descending on the plain passes away in a south-west direction, its course being distinctly marked by an upheaving of the plain. Other good examples of these instrusive rocks may be seen ridging the surface between Hursool, and the Delhi gate of Aurungabad.

Silicious dykes are of common occurrence in the wacken beds. Wherever they may have intruded, the rock on either side to the distance of some inches, has become indurated and altered in color; silicious minerals are abundant upon the plateaux of the hills. In the vicinity of Gowtala, Kunhur and Rauzah. Jaspideous clay stone variously colored and Heliotrope are met with in great profusion and beauty, as well as fine specimens of calcareous spar, and a peculiar variety of opaque calc spar of a pale green color is apparently so

tinged by chlorite: to these may be added the several varieties of quartz. The zeolitic minerals are principally fallen in with below the hills generally along the beds and banks of the larger nullas, where beautiful varieties of the foliated and radiated description abound.

Calcareous conglomerates overlaid by nodular basalt may be seen in the exposed banks of the Sewna river at Kunhur ; the buried masses are rolled and water worn and similar in their nature to the present shingle of the river bed.

Natural Aspect.

The natural diversities in the aspect of the country are great, wide undulating plains occupying the south and west, offering a far tamer description of scenery than is observed towards the north and east, where the Circar is seen rising into an elevated region, crossed by a succession of narrow ranges, whose sides though bare and rugged, enclose valleys and dells of singular beauty and fertility. Their perennial streams produce a constant verdure, in pleasing contrast to the arid look the plains put on shortly after the ceasing of the rains, the mountain streams escaping to the low lands, are all seen trending their course towards the great bed of the Godavery in which direction the whole of the plains decline ; a low stunted vegetation principally composed of Cassia, Acacia, Capparis, Mimosa, Prosopis, and Carissa, prevail upon the plains ; whilst proceeding northward, well wooded districts appear with a jungle vegetation, often present among the ravines and gorges of the higher ghats.

Though a very considerable proportion of the surface be occupied by mountainous tracts and soil of a barren nature, still allowing for this deduction it contains much land of a very superior nature, manifested in the luxuriance of the growth of the cane and poppy and heavy corn crops raised throughout the Circar.

The cultivated soils are of two descriptions; that prevailing on the higher tracts is generally of a heavy rich aluminous character whilst on the plains it is principally a light and fertile loam; in either case of no great depth and resting upon a rocky substratum.

These two soils are derived from the wearing away of the surface rocks; the basalt going to form the stiff dark soil, whilst the amygdaloid wacken disentegrates into a friable earth: the lime and

sandy particles of which mingling with the stiff aluminous soil, counteracts its tendency to contract in the hot weather, as well as giving it higher powers of absorbing moisture; on the other hand, the wasting of the basaltic rocks mixing with light friable earth converts it into rich loamy lands, diminishing its radiating powers and causing it to be more retentive of moisture.

Such is the exuberant fertility of basaltic soils in general, that some are said to bear wheat cropping for thirty years in succession without a fallow, the secret rests in the knowledge that those inorganic substances plants require for their healthy condition, are lavishly afforded in the decomposition of these rocks, which year by year are spontaneously undergoing chemical changes by the alternate influence of heat, moisture, light, and air; and thus, unseen, are constantly restoring to the soil those inorganic substances the crop has been consuming. In the absence of these facts, it would be difficult otherwise to conceive how such fertility could exist in such a wretched looking soil, but here appearances are no criterion of its quality.

The number of beeghas contained in the whole Circar is estimated at 18,56,266, of which the Baghaet lands, or such as receive the benefits of irrigation, amount to 54,263 beeghas, 15 pds. The remaining cultivated portion, comes under the head zeroyet, and are stated at 4,80,543 beeghas, 17½ pds.; besides these 1,57,718 beegahs, 12 pds. are occupied in Enams, and 7,26,411 beeghas, 7¾ pds. lie fallow, the remaining portion being taken up by waste and barren lands, amounting in the aggregate to 4,37,328 beeghas, 19 pds.

The Koonbees call the dark soil kala muttee, and that remarkable white description only found in the neighbourhood of villages, pundree muttee; when calcareous matter is much mixed in the land it is termed choonkuda; if sand prevails, mulwut thamdee is the red soil formed by the breaking down of the ferruginous clay beds, and bulda when very stony, as is often the case along the foot of the hills.

Climate.

The climate of the Circar derives its peculiarities from a combination of circumstances principally referrable to its geographical position, prevailing winds, and the nature of its soil, and substratum, all of which have their share in modifying the climate.

The elevation above the sea is sufficiently great to effect the temperature, the highest points being about 1,800 feet, and the lowest 1,000 above the sea. The ghats that stretch along the western coast interpose their lofty barriers to the current of the monsoon, causing but a partial fall upon the countries east of them; the quantity of rain that falls within the Circar varies from 20 to 40 inches, the last year's rains, which were considered more than usually heavy, were found to have been 44 inches, the particulars of which were noted at Aurungabad, the distribution of which was as follows:

	Inches.		Inches.
January,	0· 00	July,	6· 78
February,	0· 00	August,	2· 39
March,	0· 00	September,	18· 31
April,	0· 12	October,	1· 00
May,	5· 69	November,	1· 86
June,	7· 85	December,	0· 00

We are not in possession of any observations of the rain guage that may have been taken on the higher parts of the district, but the fall must very far surpass that which is experienced on the lower levels, for floating clouds laden with moisture, are constantly seen passing over the flat country towards the higher ranges to the north, on which they discharge themselves.

As the sun passes into the southern tropic, the wind that generally prevails is from the north-east, lasting until its return again; bringing up the monsoon, during this period. The leading feature of the air is its excessive dryness, increasing as the season advances, from the extensive heated surfaces it has passed over.

The face of the Circar being crossed by numerous high ranges, electrical conditions of the air are induced which influence the currents of the atmosphere and produce at times sudden high winds.

The lowest range of temperature observed in the cold season was 46°, but it descends lower than this in localities favorable to the cooling effects of evaporation and radiation, as may be experienced in the vicinity of great masses of cultivation at night time. Late in the cold season it is by no means an uncommon circumstance, to note a diurnal range in the temperature of 40°, and upwards, from this cause, the face of the country being then covered with cultivation. The highest temperature was in May rising to 99° in the shade; upon the higher portions of the Circar the range is more confined,

seldom sinking so low, or rising so high as that now specified, but generally observing a more equable and moderate temperature. It has been supposed that frost is unknown in the Dukhun, but in the cold season of 1846, it caused great damage to the cane, poppy, tobacco, and wheat crops in many parts of the Circar.

Vegetable Productions.

In noticing the vegetable productions of the province it will be necessary to confine the investigation strictly to such plants whose peculiar qualities bear upon the necessities, conveniences, or gratifications of life, and for this purpose it will be convenient to consider them under the following arrangement:

1. Plants valuable for food; as esculent grains of all descriptions, garden vegetables, and fruits.

2. Plants used as food and fodder for domestic animals, and cattle.

3. Plants useful for medicinal purposes.

4. Plants employed as materials in the arts and manufactures.

5. Plants of an ornamental nature.

1st. *Plants valuable for Food.*

Esculent grains.—Gheeong, triticum sativum; bajree, holcus spicatus; jowarree, holcus saccharatus; chawul, oryza sativa; khundee, andropogon punctatus; mukkie, zea mays; rallah, panicum italicum.

Leguminous plants.—Ooreed, phascolus maximus; moong, phascolus trilobes; muth, phascolus aconitifolius; tour, cytisus cajan; mussoor, ervum hirsutum; kottee, dolichos biflorans; saim, dolichos; bun saim, dolichos lablab; mukhun saim, dolichos gladiata; (white var) runga mukhun saim, dolichos gladiata; (red var) mutke, dolichos fabœformis; batana, pisum sativum.

Esculent roots.—Aloo, solanum tuberosum; salep, orchis var. kuchaloo, helianthus tuberosus; moolee, raphanus sativus; ghor aloo, dioscorea alata; pend aloo, convolvulus batatus; soorum, arum campanulatum; gajur, daucus carota.

Alliaceous plants.—Peeyaz, allium cepa; lussun, allium sativum; kheera, cucumis sativus; karkaroo, cucurbita; pepo kuddoo, cucurbita lagenaria; kurilla, momordica charantia.

Vegetables bearing fruit.—Brinzal, solanum melongena; wall

wangee, solanum lycopersicum; meerchee, capsicum fruitescens; baindee, hibiscus esculentus; singara, trapa bispinosa.

Pot Herbs, &c.—Chooka, rumex vesicarius; myal ke bhajee, basella rubra; umbaree ke bhajee, hibiscus cannabinus; maytee, trigonella frenum grœcum; ghol ke bhajee, portulaca oleracea; soolfa ka bhajee, anethum graveolens; souf, anethum fœniculum; poodeena, mentha viridis; kotmeer, coriandrum sativum; udruk, zinziber officinalis; huldie, curcuma zerumbet; ajonan, ligusticum ajonan; raie, sinapis chinensis; pawn, piper betel; bhang, cannabis sativa; kala toolsee, ocymum basilicum. The unripe legumes of the hyperanthes moringa, varieties of bauhima, and prosopis spriegera, choolæ, amaranthus polygamus, besides many other varieties of amaranthus, as well as every palatable and wholesome leaf, which comes not amiss to the poorer natives as a bhajee in their food.

Fruits, stone fruit.—Amb, mangifera indica; shuftaloo, amygdalus persica; jamoon, calyptranthes jambolana; bhair, zozyphus jejuba; aula, phyllanthus emblica; chironjee, buchanania latifolia.

Kernel Fruits.—Seeta-phul, amona squamosa; jamb, psidium pyriferum; anar, punica granatum; kuranda, carissa carandas; papaeea, carica papaya; burooari, cordia myxa; jootai karoonda, flacourtia sepiaria.

Pulpy Fruits.—Unjeer, ficus carica; khela, musa sapientum; chuppul saynd, cactus indicus.

Bacciferous Fruits.—Ungoor, vitis vinifera; of which there are five varieties—hubshee, sybee, fukree, bokree, and bedaneh; toot, morus indica; kuhirj, fragaria; tuparee, physalis perruviana; boimvong, arachis hypogia; phulsa, grewia asiatica.

The Orange Tribe.—Nurangee, citrus anrantia; having three varieties, cintra or sungtra, kowla, and the bengalee; a small species; meetha neemboo, citrus limetta; ambut neemboo, citrus var; weer, citrus limona; chukotar, citrus decumana.

Cucurbitaceous Fruits.—Kurbooz, cucumis melœ: of these there are the following varieties: jamb kurbooz; ghilkee kurbooz; burra masee kurbooz; toomree kurbooz; chuckrea kurbooz; and cowha purree kurbooz; turbooz, cucurbita citrulla.

Hard Shelled Fruits.—Kuthbel, feronia elephantum; bel, ægle marmalos; imlee, tamarindus indica; rozelle, hibiscus subdariffa.

The above list of valuable vegetables and fruits are such as were

generally met with; the number could have been readily extended had the European gardens been explored, but the object being to give only such as were indigenous to the soil European vegetables have been purposely omitted, though all the varieties that are usually cultivated in India thrive most satisfactorily. The province has long enjoyed much celebrity for the delicious nature of its fruits, particularly its grapes, figs, and oranges. A favorable range of temperature together with a rich permeable top soil, a lower one not too retentive of moisture, and an abundant supply of water in flowing streams, or close upon the surface, all conduce to the strength and vigour of vegetation. To diminish the injurious effects of the high winds often prevailing, it is customary to surround the gardens with a high hedge composed principally of the milk bush and other trees of a compact foliage which oppose a screen to the force of the wind, and deprive it of much of its desiccating power. The variety of pot herbs, pungent aromatics, legumes and roots, with a few exceptions, receive little or no care in their culture, and may almost be considered as spontaneous productions.

2. *Plants used as food and fodder for domestic animals and cattle.*

There are several varieties of indigenous grasses that afford excellent fodder, the management of which is left entirely to nature; tracts of lands situated upon the hills near Dowlutabad are set apart as rumnahs for the use of the cantonment of Aurungabad; the better kinds of grasses of the hills are called by the natives the shaira poonea, marayel, koonda, and goondalee, but the most valuable of all is the hurriallee, which with the seepree, and kurreeyel, are common to the plains and rich vallies. In seasons of ordinary occurrence as much grass may be purchased for a rupee and a half as will provide fodder for a horse for a month, a bullock will eat about a rupee's worth, and a camel nearly twice that quantity, but in dry seasons cattle are hard pressed for fodder, and from the improvident habits of the ryot, no provision for such a calamity is ever made, so that their cattle perish in consequence. Possibly guinea grass if judiciously introduced, might be a valuable assistance, if its cultivation did not involve too great an expense. Lucerne is raised in gardens, but only in small quantities. The ryots generally feed their oxen upon the dry stalks of the

jowarree and bajree, the nourishing quality of the former in particular, keeping them in good working order; to this is added green food afforded by green jowarree, bajree and mukkai, leaves and tender tops of the sugar cane, and waal a species of dolichos, &c. The trash from the sugar mills comes in as fodder to the oxen working at the mill, and the refuse of the kullees all goes to assist as food. Buffaloes find good pasturage upon the banks of the streams; the borrago indica which is common on heavy lands, is greedily eaten by them, and, it is said, causes them to give down their milk freely. Camels find good grazing amongst the valleys, in the leaves of the peepul, banyan, umlee, neem, baubul, &c., but their general food is dry grass through half the year. The tanks and nullahs provide a plentiful supply of sedgy succulent plants for elephants who are also assisted by the leaves of the peepul, banyan, cotton trees, erythrinas and adansonias: the low jungle of mimosa supply food in abundance, for browsing goats, as their pods and seeds in dry seasons afford nourishing food. The number of sheep bred and kept is but inconsiderable.

3. *Plants useful for medicinal purposes.*

Abrus Precatorius, Gooneh. A succedaneum for liquorice.

Acacia Arabica, Babool. Produces a valuable gum.

Acacia Catechu. Affords the astringent extract of catechu from the old wood.

Adansonia Digitata. Its virtues are unknown to the natives, but in Africa and Egypt it is much used for medicinal purposes. It abounds in mucilage; the leaves dried and powdered are said to be serviceable in fevers and diarrhœas. The pulp of the fruit is subacid, and the juice mixed with sugar, is valued as a specific in putrid fevers. The dried pulp is a remedy in Egypt for dysentery, and the leaves are eaten by the Africans, in order to restrain excessive perspiration.

Ægle Marmalos, Bel. The pulp is considered to be specific in chronic diarrhæa; leaves, roots, and bark in decoction given in nervous complaints.

Andropogan Irasacusa, Rhowsah, Grass Oil. A fragrant rubefacient.

Arachis Hypogen, Boi-Moong, Earth Nut. A sweet oil is expressed from the nut, having the property of not turning rancid.

Areca Catechu, Foflee Sooparee, Betel Nut, Palm Nut. Narcotic and intoxicating: spurious catechu is prepared from it.

Argemone Mexicana, Feringhee Datura, American Thistle. Juice of the plant powerfully alterative and detersive, used in cutaneous and eye disorders.

Aristolochia Bracteata, Keera mar, Birthwort. A few drops of its intensely bitter juice, squeezed into wounds kills worms; hence its native name; dried leaves are anthelmintic; the fresh leaves are given for purging with gripes.

Asclepias Gigantea, Mudar, Gigantic Swallow-wort. This plant abounds in an acrid milky juice, which with the plant itself is employed in the treatment of all descriptions of nervous diseases by the natives. It has been also successfully used by the faculty in the cure of leprosy, lues, tenia, herpes, dropsy, rheumatism, hectic and intermittent fevers, given in doses of five grains of the powdered bark twice a day. The nausea or vomiting it may create, being removed by a purgative of castor oil. The active properties of this drug are found in the presence of a singular substance termed mudarine, having the property of coagulating by heat and becoming again liquid on exposure to cold.

Asclepias Acida, Sour Swallow-wort. Its milkly acid juice allays excessive thirst.

Asclepias Psendosarsa, Indian Sarsaparilla. Very generally employed in India by Surgeons as a substitute for sarsaparilla. Professor Lindley informs us that large quantities are now consumed in London as a fine kind of sarsaparilla, and is inclined to believe that the smilasperic acid of Mr. Garden is obtained from this species.

Bergera Konigu, Kari pak. Decoction of leaves given in dysentery: the bruised bark, root and leaves applied as stimulants.

Boswellia Glabra, Salai. Affords the gum olibanan.

Buchanania Latifolia. Kernels of the nut afford a bland oil.

Butea Frondosa, Palas. Seeds are said to be anthelmintic.

Cardiospermum Halicacabum, Balloon Vine. Root and leaves aperient.

Carica Papaya, Pupaea. The unripe fruit is eaten as a vermifuge.

Carthamus Tinctorius, Koosumba, Safflower. Seeds laxative; the oil applied to ulcers.

Cassia Auriculata, Turwar. The seeds reduced to powder, and blown into the eye, is a favorite remedy with the natives for country sore eye.

Cassia Fistula, Umultas. Pulp of the pod, and decoction of leaves laxative.

Cedrela Toona. Bark in decoction given in fever, and bowel complaints.

Celastrus Paniculata, Malkamnee. An empyreumatic oil is expressed from the seeds, of an acrid burning quality, and useful as a rubefacient. It has been employed successfully in beriberi.

Cissus Pedata, Gwaliya. Bruised root is applied to strains.

Cœsalpinia Bonducella, Kat Kuleja. Seeds tonic, leaves particularly useful as a poultice to hernia humoralis.

Cleome Viscosa, Dogs Mustard. Seeds hot: administered as an anthelmintic and carminative.

Clitoria Ternatea. Root is emetic; seeds anthelmintic and purgative.

Chlerodendron Phlomordes. Juice of the leaves alterative.

Cordia Myxa, Bhokur. The Sebesten tree. The mucilaginous berry when dried is the sebestena of the materia medica. Its properties are gently laxative and demulcent, and given in form of decoction in certain pulmonary complaints.

Croton Polyandra, Jumalgota. The seeds employed as a drastic purgative.

Cucumis Colocynthis, Indrayun. Powerfully drastic.

Curcuma Longa, Huldee. A favorite application of the native to recent bruises and wounds. In Java it is smeared over the body in the shape of an ointment, to guard against cutaneous diseases.

Convolvulus Turpelhuni. Root purgative.

Dalbergia Oojeinensis. Bark astringent, and used as a cattle medicine in bowel complaints.

Dalbergia Arborea, Kurrunjee. Juice of the fresh root is detergent. Oil, expressed from the seed, externally applied as a rubefacient.

Datura Fastuosa, }
Datura Alba. } Virulently poisonous and narcotic.

Euphorbia Ligularia, Munsa Shij. Root valuable, mixed with pepper, in snake remedies.

Euphorbia Tiraculli. Common milk hedge. The fresh juice employed as a vesicatory by the natives. A decoction of the root is carminative; the acrid juice, mixed with butter, is purgative.

Evolvulus Alsinoides. Decoction of the plant useful in bowel complaints.

Feronia Elephantum. Wood-apple. Gum is demulcent in bowel complaints : leaves stomachic and carminative.

Gentiana Verticillata. Tonic and stomachic. An extract is formed from this plant every way equal to that made from the officinal gentian.

Hedysarum Sennoides. Root tonic, and externally applied in rheumatism.

Herpestris Monniera. Juice used as an external application in rheumatism.

Hibiscus Populneus. Decoction of the bark alterative.

Hyperanthera Moringa. Horse raddish tree. The green root administered in fevers, and applied in a fresh state as a stimulant. An oil expressed from the seeds eases pains of the joints in rheumatism.

Jatropha Curcas, Erundee. Nut purgative: juice of the fresh plant detergent.

Justicia Ecboluim. Leaf and root tonic and antispasmodic.

Justicia Paniculata, Creyat. A very valuable bitter.

Linum Usitatissimum. Seeds discutient.

Melia Azederachta. An oil is expressed from the seeds, useful for expelling worms and cleansing foul ulcers; it is also applied as a rubefacient in rheumatism. Decoction of the leaves a favorite discutient with natives.

Melia Azederach. Root bitter. Anthelmintic.

Mentha Sativa, Podeena. Infusion of mint, a favorite remedy in dyspepsia.

Mimosa Ferruginea. A wash for scorbutic gums is made from a decoction of the bark.

Mimusops Elengi. Water distilled from the flowers is considered useful in melancholia.

Mirabilus Jalapa. Root purgative.

Monetia Barleriordes. Juice of the leaf bitter and expectorant.

Morus Indica. Fruit gently laxative.

Nerium Odoratum. Bark repellant; root taken internally poisonous.

Nerium Antidysentiricum. A valuable tonic; the true conessi bark is afforded by this tree, but the difficulty in procuring the

genuine species has brought the drug into undeserved disrepute. The natives deem it a specific in dysentery and bowel complaints.

Nicotianum Tabacum, Tumbako, Tobacco.

Ocymum Sanctum. Expressed juice assists in the cure of ringworm.

Odina Wodier. Powdered bark mixed with oil is applied to indolent ulcers.

Pandanus Odoratissimus. The immature fruit is reputed emmenagogue.

Papaver Somniferum. The juice expressed from the seeds is considered useful in chronic diarrhœa, and their oil very bland and pure, fitting it for culinary purposes.

Phyllanthus Emblica, Myrobolan. Yields a nut of a harsh bitter taste, striking a black colour with solutions of iron, said to be gently purgative, astringent and corroborating.

Plumbago Zeylanica. Root in decoction is administered in fevers: the fresh bark bruised and applied to the skin vesicates.

Portulaca Quadrifida, Diuretic. The bruised leaves are applied in erysipelas.

Punica Granatum. Pulp cooling and aperient. The rind of the fruit is very astringent, and useful in diseases where this virtue is required. It is given to destroy worms.

Ricinus Communis. The castor oil of commerce is generally procured from the seeds of the smaller variety. A valuable purgative in cattle medicines is found in the root; a piece the size of a nutmeg mixed with chillies and tobacco leaves is a successful remedy in gripes.

Rumex Vesicarius. Useful as an antiscorbutic.

Saccharum Officinarum. The juice of the sugar cane is considered to be the best antidote to arsenic.

Sapindus Detergeus, Rhete, Soap Nut. Possesses singular and specific powers in chlorosis, the shell of the nut powdered, and snuffed up the nostrils is powerfully errhine—the natives employ it in cephalic affections; with water the nut forms a copious lather, similar to soap for which it is an excellent succedaneum.

Semecarpus Anacardium, Bilowa, Marking Nut. The acrid juice of the nut is given internally as an alterative and anthelmintic, and the expressed oil is useful as a vesicatory, but great caution should be

employed for a very distressing erythematic ædema sometimes supervenes upon its application. The fumes of the burning wood even have been known to produce this to a very severe degree; the face assuming a shapeless mass, from the diffused swelling occasioned. Some constitutions are so susceptible of its deleterious influence that even remaining under the shade of the tree causes œdematous swelling and eruptions. The native remedy in these cases, is merely to rub the swollen parts with the inner pulp of the cocoa nut bruised.

Sesamum Indicum. Leaves emollient, seeds contain a fixed oil, very sweet and pure.

Solanum Rubrum. The whole plant is supposed to possess powerful diuretic virtues.

Solanum Trilobatum. The plant is considered tonic and carminative. Flowers as well as roots, leaves, and stalks being used.

Sterculia Urens. Bark abounds in mucilage, which is in some respects like tragacanth.

Swietenia Febrifuga, Rohuna. Is a powerful tonic, and useful in the cure of intermittent fevers.

Tamarindus Indica. Pulp is slightly aperient; the kernels reduced to powder and formed into a paste, have the power of promoting suppuration in indolent tumours.

Terminalis Belerica, Beleric Myrobolan. Astringent.

Tribulus Terrestris. Leaves and root diuretic.

Vitex Trifoliata. Leaves repellant in rheumatism; seeds are said to have nervine, cephalic, and emmenagogue virtues.

Zingiber Officinale. Root employed as a valuable stomachic.

4. *Plants employed as materials in the Arts and Manufactures.*

Oil Plants.

Plants cultivated for oil are the carthamus tinctorius, kuldie, safflower. Sesamum orientale, tillee; racinus communis, castor oil; linum usitatissimum, linseed; kurleh, verbesina sativa. Those spontaneously produced are the kurrunj oil, expressed from the seeds of the dalbergia arborea; malkumnee oil, from the seeds of the celastrus paniculata; and grass oil, commonly termed rhowsah oil, from the andropogan irasacusa.

Gums.

A variety of gummiferous trees are found upon the hilly portions of the Circar, the principal of which are the acacia arabica; feronia elephantum; conocarpus latifo-

lia; feronia elephantum; boswellia glabra, neem; sterculia urens; butea frondosa; buchanania latifolia; bombax gossypinum, cedrela toona, &c., the whole of which are more or less adapted for economic purposes.

Dyeing Plants. Grislea tomentosa, rottlera tinctoria, morinda citrifolia, bixa orellana, nyetanthes tristis; butea frondosa, tamarindus indica; hibiscus populneus, dalbergea oojienensis, curcuma longa, terminalis belerica; phyllanthus emblica, punica granatum, &c.

Tanning. Several plants are found that possess high powers of preparing leather, by the amount of extractive matter they contain, in addition to their tanning, which makes the skins peculiarly soft and durable; of these there are one or two varieties of the acacia, the principal being the baubul; dalbergia oojienensis; conocarpus latifolia, terminalia alata, cassia auriculata, and phyllanthus emblica.

Charcoal. Acacia arabica, and other hard grained species of mimosa are used by the natives to burn into charcoal for common purposes, but that manufactured for gunpowder and fireworks is procured from the stems and roots of the asclepias gigantia and euphorbia tiraculli.

Cordage. The cannabis sativa, ganja; and hybiscus canabinus, ambaree, are cultivated for the sake of their fibrous stalks, being converted into hemp; the bark peeled from the roots of the butea frondosa constitutes the usual rural cordage.

5.—*Ornamental Plants.*

Trees possessing the greatest claims to an ornamental character are the following;—Two or three species of acacia, of which the ram kanta is an elegant instance; cordia myxa chlerodendron; melia calyptranthes; carissa; parkinsonia mimusops elengi, and mimusops hexandra, both of which the Mahomedans, with much taste, were in the habit of planting about their burial places, in company with the poinciana pulcherrinia and annona squamosa. Around Aurungabad are to be seen several magnificent specimens of the adansonia digitata, a legacy in all probability from the Abyssinian founder. Upon the undulating knolls between the valleys the most

striking in beauty are the grislea, pavetta, prosopis, flacourtia, banhima, clematis, combretum, celastrus, climbing solanum, butea, numerous kinds of asclepiaceæ and mimosa. The most conspicuous within the ravines are the sterculia urens, dalbergia oojienensis, begnonia, erythrina, santalum, grislea, boswellia; one or two varieties of bombacea, phyllanthus, nerium, gardenia, grewia, gmelina, conocarpus, bambusa, ficus, tectona grandis, and cedreela toona, the specimens of the latter have evidently been planted. The more lowly forest vegetation that claims a passing notice under this head, is the gloriosa superba, capparis, ajuga spermadictyon, evolvulus hirsuta, gentiana verticillata, justicia, lavandula burmi, plumbago, loranthus, nerium odorum, oxalis, and tamarisk. Before closing these remarks I would observe that the size of the trees increase as the country rises towards the north amongst the rich valleys of which, very noble specimens of the forest may be seen. As instances of which I may mention having measured at Nangapoor the stem of a butea frondosa, usually met with as a lowly growing shrub, here expanding into a girth of thirteen feet and a half, with proportionate height of upwards of sixty feet; the stems of the milk bushes measured three feet round. At Tajnapoor a melia azederachta was thirty-five feet round the but, and eighty feet high; and at Padree a venerable tamarind tree supposed by the villagers to be three hundred years old, is seventy-four feet high and thirty-six in circumference.

Mode of Cultivation.

Such is the remarkable social condition of the natives of India that it is by no means improbable the state of agriculture witnessed now-a-days, was pretty much the same as practised at very remote periods; a polity like theirs, which condemns the great body of the people to a hopeless state of degradation, confining their enjoyments of life to the very lowest minimum of all things needful and necessary, must tend as a matter of course to repress every desire for improvement, in the benefits of which they would not be allowed to participate. If to this cause be not attributed the low state that we find agriculture languishing under, it will be difficult to seek elsewhere for more sufficient reasons. The (Koonbees) cultivators are, generally speaking, an inoffensive, temperate, and all things considered, a hard working class; by no means deficient in intelligence, and well acquainted

with the leading principles of Indian agriculture. The knowledge of the past has served them for their guide, handed down from the remotest period by father to son. In their modes of culture we perceive their full acquaintance with the principle on which the succession of crops is founded, and from time out of mind have they been adopting drill husbandry practice, only commenced in Europe the middle of the last century. Reasoning upon these two facts alone, we cannot but accord to the Koonbee a far higher degree of excellence, than what, from their present unsatisfactory condition, we might feel at first disposed to allow, and which under any other state of society would have raised the art of agriculture to the same degree of importance it has assumed in other countries exempted from such evils as subject the cultivator to perpetual poverty.

Enclosures. The mode of culture is as simple in its operations as it well can be, the particulars of which we will, now, consider. Beginning with the enclosures, we find a great deficiency in their protection, and rarely to be met with elsewhere than around sugar cane, or pan gardens, for the scanty supply of dry thorns stuck round growing crops, in the vicinity of public highways, hardly deserves the name. Hedges are more commonly met with on the higher parts of the Circar, than on the low lands ; consisting generally of the euphorbia teraculli, carissa baubul, jatropha, flacourtia, cæsalpinia, and chlerodendron. The cultivation, for the most part lying unprotected, is at the mercy of stray cattle, and innumerable herds of deer ; they attempt to scare the latter away by earthenware pots white-washed, and distributed about the fields on poles ; or stakes are driven in the ground around the skirts of cultivation, to which loose twisted grass ropes are attached, these the deer instinctively avoid as snares.

Boundaries. Boundaries are marked by slabs of rough stones, trees, or a broad stripe of land left unploughed. I am told it was an ancient custom in this part of the country, to place charcoal at the cardinal points under large stone pillars, or unhewn blocks; these were called "soor suma," and held in especial regard, the removal of which would be considered a heinous misdemeanour. Boundaries are often now the subject of angry disputes from their undefined limits. Every field originally had a name, in

accordance with these old boundaries; where the marks have disappeared new ones are given.

Farm Yard or Kullee.

The farm yard or kullee, is an enclosed space of ground outside the village. Here the grain is stored up, as brought in from the fields, and the usual allotments made. The grain is cleared from the husk, by driving cattle over it, though differing in one respect from this ancient mode of beating out the corn, by muzzling the cattle employed. Winnowing is managed by holding a basket of grain at arms length over the head, and allowing the wind to scatter the chaff as it is slowly poured upon the ground.

Kungee or Grain Stone Basket.

In storing grain for the current year's supply it is usual to place it in wicker baskets called a "kungee," about six feet in height, the bottom and sides of which are protected from insects by a coating of cows' dung, and a chuppur over the top to preserve it from the weather: it generally standing outside the house. These baskets hold from five to fifteen maunds. When the grain is to be stored up in any quantity for long periods, under-ground vaults are prepared called "pews," where it will remain in good preservation for several years; these receptacles vary in dimensions according to circumstances, holding from 120 to 225 maunds.

Pews or Grain Vaults.

The ground they are formed in is either the pandree muttee or soft morrhum. The first step in their construction is to sink a small shaft about the height of a man, and in which he can conveniently turn round: a circular opening is then dug in the bottom sufficiently large to admit a man to pass, and the ground excavated into a vaulted chamber. No further precautions are taken with the preservation of the grain, than to line the sides with stalks of kurbee, and close the orifice of the vault by a round flat stone, in shape similar to the common chukkee: the shaft is then filled up, and the surface smoothed down. It is a very remarkable circumstance that the intense heat the grain is subjected to in this confined state, does not deteriorate its quality, it being dug out uninjured after so long a lapse of time as even twenty years, the heat engendered is so great, as to prevent a man descending at once into the pew when first opened, and takes a day or two to cool before he can conveniently enter the place, to this circumstance is referred its not being infested with insects.

Implements.

The rude appearance of the implements of husbandry are strictly in unison with its simple character, raising our opinion of the Koonbees by the ingenuity and patient perseverance they evince in their successful attempts to supply the place of more elaborate contrivance, which after all are not adapted for India, where the cost of labor comparatively speaking is so trifling: the great desideratum in this respect, being not to supply an expensive or complicated machinery, but simply to facilitate the operations of the field by improving such as are already found in use, what these implements are, we will now proceed to examine.

Plough.

The plough or nangur is very primeval in appearance, possessing neither coulter nor mould board. The instrument is a crooked log of wood, cut from the baubul tree, bending nearly at right angles, and wedge-shaped. The point that turns up the soil, or share, has an iron shoe, or, in some instances, an iron bar fastened on the upper portion, projecting slightly over the forepart, and fastened at the back into the body of the plough: the whole kept secure by an iron hoop that slides over all, to the upright body the beam is attached that draws it, and the stilt or handle to guide its movements is fastened in a perpendicular manner at the back part. The breadth of the hinder part of the wedge shaped log performs very imperfectly the offices of a mould board. The yoke which is always clumsy and unnecessarily heavy, is attached to the beam by means of a long loop, rove through a moveable wooden collar, or block, that is placed beneath the beam; the loop passing over the yoke regulates the angle of the beam, by being pulled tightly or loosely, according to circumstances, a rope being fastened to the body of the plough for this purpose, which leads through a ring attached to the loop. In heavy lands four oxen are required to work, in the lighter ones but two. The share penetrates the soil to the depth of from nine to twelve inches. The whole machine costs about two Rupees. It is not improbable but the form of the Indian plough is far better adapted for the country in general than any now in use in Europe. It performs very effectually the object required, which is not so much to raise a new soil to the surface, possibly of a crude and injurious nature, as to expose the surface itself to the action of the air, which with

the assistance of the bukkur, or bullock hoe, it very thoroughly effects.

Bullock Hoe.

The bullock hoe or bukkur is a most important instrument in Indian husbandry, and serviceable both for stirring the top soil and cutting up the weeds. It has a broad blade of iron fixed obliquely into a log of baubul wood about three feet long with a handle rising straight up. In stiff soils it requires two pair of bullocks to work it, cutting through the roots of weeds to the depth of three or four inches below the surface.

Double Bullock Hoe or Dowra Koolpue.

There is another species of bullock hoe differing from the bukkur, by having two blades instead of one and of smaller dimensions. It is called the "dowra," and is an instrument well adapted for weeding drilled crops, and earthing up young plants.

Drill Plough or Charra Tiffan.

The drill plough or "charra" has been in use from very early periods, and being particularly well adapted for the soil is generally employed; admitting of the dowra to destroy the weeds very readily as well as to loosen the earth between the rows. This implement consists of a bowl-like receptacle for receiving the seed into which the hollow bamboos are inserted for conveying the seed into the furrows, which are made by three small shares attached to the body of the instrument, behind which the opening of each several bamboos is placed. The value of such an instrument varies from 2 to 3 rupees.

Carts.

The carts are very awkward and unwieldy machines, particularly those in use about hilly districts: axle-trees are made of wood, and the wheels of the hill carts are generally wooden discs, encircled by a rim of iron. The body is a solid piece of timber of the breadth of the cart and rests upon the axle-trees which are attached to it by two wooden pins. Upon this two long pieces of timber extend horizontally, situated in the centre, and not very far apart, supporting the frame-work of the machine which is square: two poles having their ends passed through the body and pinned, are lashed together, and form the beam to which the bullocks are attached. A cart is able to carry thirty maunds, and costs about forty rupees.

Kodalee or Pickaxe.

Two or three implements are employed for digging and rooting up old trees, these are the kodalee, and powrah. The kodalee is a small pickaxe, differing from the European one, in only having one pick; its value is about 12 annas.

Powrah or Digging Hoe.

The powrah or digging hoe is a blade of iron attached to a wooden handle, at a very considerable angle. Of these instruments there are two forms in general use; one in which the blade approaches a wedgelike form, the angle of union with the handle being very acute, in such a case the lever has its fulcrum thrown too close to the force applied, and much of its efficiency, as a digging instrument, rendered migratory; in the other form, which is the one most commonly met with, the blade is square, and placed on the handle at a smaller angle, throwing the fulcrum further from the hand towards the resistance. Their cost is about 12 annas.

Sickle or Durantee.

The sickle or durantee is employed for cutting grain and grass, they are of a semicircular shape; a line drawn from heel to point varies from seven to nine inches; average price 4 annas.

Koorpue, or Hand Weeding Hoe.

Weeding hand hoe, or koorpue, is a small implement, used for weeding; being a narrow iron blade, fixed in a wooden handle, the point of which is slightly falcated, and costs about 1 anna.

Manures.

The natural fertility of the soil of India, has occasioned a neglect of the important subject of manures. In these districts its chemical constitution exhibits a rich amount of inorganic salts; the various qualities of which are essentially requisite, in obedience to a fixed law of vegetable organism, for the perfect development of the several parts of the plant. It is in trap soils that we may look for a bountiful supply of aliment for the vegetable world, the amount varying with local circumstances, but even when so small as to afford but a single grain in each pound of soil a foot deep, it still is equal to ℔s. 500 in an acre. Flooding the country during the rains, spreads far and wide the soluble salts of the wasting rocks, hence

the remarkable fertility of certain trap soils, which are said to possess the power of raising wheat, the most exhausting crop that grows, for thirty years without a fallow recruiting its last energies by the restoration of these salts during the rains; and in some countries, I believe in the Azores, the most luxuriant crops are raised, with no other manure than that afforded by pounded trap rocks, strewn over the land. These rocks, if examined into, will be found to produce abundant materials for a soil when reduced by the action of the air. For instance, in felspar we shall obtain potash, alumina, silica, and lime. In hornblende, magnesia and iron; the zeolitic minerals are composed of silica, alumina, lime, soda and iron; and in chalcedony, silica and alumina; whilst in quartz we find silica in a pure state, and in jasper mixed with iron. Here there are materials for a soil highly favorable to vegetable life, which are brought into active operation by the rains, and unlike the evanescent character of soils enriched solely by vegetable matter, are permanent in effect. The usual practice is not to manure any crops but sugar-cane, poppy, and pan; the source from whence this is derived is the village mixen, and occasionally folding cattle. A very valuable manure for cane lands lies totally neglected in the heaps of cane ashes besides the sugar mill, and are not deemed sufficiently worth returning again upon the land, which, were it done, abounding as they do in silicates, could not but prove highly useful to the plant, which, it is well known, particularly needs these supplies. Green manures are occasionally applied to worn out soils. The green stalks and leaves of the tobacco plant are always ploughed into the land after the crop is pulled. Nothing can be more injurious and unfair towards the soil, than the pernicious custom of converting the excrement of the cow into fuel.

The cultivator divides the year into three seasons. The toossur, when green crops ripen in the rains; the khureef, ripening in October; and the rubhee, ripening in February, he commences his year with chytra shood in April, and at the dewallee considers the rainy months over and the dry season commenced. The Koonbee is well acquainted with the important fact that crops of opposite natures succeed each other with better success, than such as are of similar kinds, and has long put the principle in force. Oil plants as kuldee or karleh, are generally first sown, and then followed by wheat, jowarree or bajree. The Indian mode of mixing, cleaning, and

exhausting crops together is an excellent system. For instance jowarree is generally sown with moong and umbarree ; bajree with kooltee, ralla, mut, moong, umbarree, and tour ; and wheat with kuldee and mustard. Thus the several grains and pulses of different natural families do not interfere with each other's welfare, a fact attempted to be accounted for by modern cultivators, in the supposition that in mixed cultivation where plants are associated of various natural families, each particular kind derives dissimilar inorganic matter from the earth, for their own particular nutrition : that which is rejected by one sort being appropriated by another.

Staple Vegetable Products.

The principal staple vegetable productions are wheat, bajree, jowarree, chenna, sugar, tobacco, rice, tour, kuldee, and hemp.

Wheat. The land best adapted for wheat, is the rich loamy soil of the plains where it requires no irrigation, unless in great droughts. The varieties grown are the bunsee, poteah, and kuteah, the first named being the finest kind but needs irrigation, and is therefore less generally cultivated than the last which is raised in vast quantities, particularly in the districts of Phoolmurree, Gandapoor, and Untoor. Bunsee, which is a black bearded variety, is grown in some places on the higher lands, but gives place to sugar cane, which is there found a more remunerative crop.

The outturn of all dry crops in 1846 was very short and scanty, in consequence of the little rain that fell, and, what was worse, having been preceded by three remarkably dry seasons. The quantity of land under wheat cultivation in that year was 89,094 beegahs 15 punds, producing 32,008 pullas 30 seers, the net value of which at the average price of 7 rs. 1 a. 1 p. per pullah, gives 226,230 rs. 6 as. 9 p., a price double that of usual years. So light were the crops, that the return did not average beyond 43 seers per beegah, or something less than a bushel and a half ; the bushel being calculated at 64 lb., this would give nearly three bushels to the acre. In the north of India, corn lands return from 16 to 44 bushels per acre ;* the average return in England being 27 bushels.

* Vide letter from H. Bell, Esq., to the Agricultural Society of India

The fields intended for wheat are left quiet during the rains, then ploughed up once, and the bukkur passed and repassed twice to pulverize the soil for the reception of seed, which is put in with the drill plough in the proportion of ten seers of bunsee, or five seers of kuteah, to the beegha, ripening at the end of February: kuldee is sometimes sown broad cast amongst the crop, but more frequently drilled in at every sixth or seventh furrow. Numerous broad shallow watercourses are scattered about the field for the purpose of well flooding the land preparatory to sowing, as well as for watering the standing crop in times of drought. The crop is twice weeded and reaped by the sickle. It is allowed to stand too long after it has ripened, a practice which must injure its farinaceous qualities for many economical purposes, by converting its starchy properties to woody fibre, as for instance in the preparation of an article of diet called "saviya" a species of vermicelli where the bunsee variety is chosen, because it possesses a larger per centage of gluten. The way it is made is by soaking wheat in water, and then rubbing the husk off in a cloth; after this it is dried, ground, and finely sifted; what does not pass the sieve is called "soojee" or "rolling;" the fine flour sifted through is kneaded into dough with a small quantity of salt, in the proportions of a quarter of a seer, to five seers of flour: the whole is then well levigated with a wooden bat for three hours, when, having been sufficiently worked, it is rolled with the hands upon a board into thread like forms, occasionally moistening the palms with ghee, to facilitate the operation.

Bajree. Bajree is grown largely in Gundapoor, Phoolmurree, Byzapoor, Untoor, Wallooj and Hursool, the amount in the Circar altogether being 1,97,923 beeg. 18 pds. producing 59,772 pul. 2 mds. 10 srs. which, at the average of 4 rs. 13 as. 1 p. per pullah, gives a net return of 2,87,996 rs. 9 as. 1 p. This crop does not require the best descriptions of soils, but frequently is found on them as a khureef crop, being occupied by cultivation of different kinds, in the rubbee season. It forms the principal article of food for the population and their cattle. The seed is sown generally during the middle of the rains, some times alone, or mixed, and is ready to be cut in five months. The Koonbees are busily employed in the hot season preparing their land intended for rain crops, and after the first falls work it with the buk-

kur backwards, forwards, and diagonally, collecting old stumps, roots, and stubble in heaps and burning on the land, to be mixed in with the soil by the bukkur, no manure is given, the crop is weeded once by the small bullock hoe. The amount of seed required for one beegah, is two seers.

Jowarree. Jowarree is not to be extensively cultivated as bajree, it is principally found upon the low undulating plains of Wallooj, Gundapoor, and Byzapoor; there are two varieties cultivated, the smaller or red kind in June, and the larger or white kind in October.

The culture is similar to that adapted for bajree. The total amount of land thus occupied is 1,42,069 beegahs 18½ pds., returning 40,997 p. which is valued at 1,89,272 rs. 14 as. 8 p., taking the average price of a pullah at 4 rs. 9 as. 1 p.

Chenna. This article is raised in large quantities in Gundapoor, Phoolmurree, and Untoor. The quantity of land thus employed in the Circar is 40,139 beegahs 15 pds. giving an outturn of 13,798 puls. 1 md. 3 srs. realizing 94,130 rs. 6 as. 3 p., at the average rate of 6 rs. 14 as. 3 p. per pullah.

Sugar Cane. This cultivation is carried on in every Purgunnah of the Circar, but more particularly in those of Phoolmurree, Taklee, Untoor, and Sooltanpoor; upon the low plains between Byzapoor and Aurungabad, there is comparatively but little, save at Dowlutabad and Hursool; that grown in the Sooltanpoor and Phoolmurree Purgunahs, is considered to be of first rate quality, the land there contains lime and iron in a state of peroxide, and so situated as to command an ample supply of water for irrigation. Great care is bestowed upon the soil in preparing it for the crop which is only grown once on the same ground every two, three, or four years according to the quality of land. The field is commenced preparing in November by ploughing up the soil no less than nine times, and manuring plentifully. Early in February the planting begins, which is done by taking cuttings from the old plant near the top, each cutting being about a foot and a half in length, which will include two or three internodary joints, the field having been prepared by the plough, either into small plots or deep furrows about 18 inches asunder, is well flooded so as to form the trenches into soft

muddy beds, the labourer casts the cuttings singly down before him lengthways, as he walks along the trench, allowing a space of but two or three fingers breadth to intervene between each cutting, and as he progresses, he presses the cutting into the soft bed, with his foot: the field is now daily flooded until the shoots have risen about six inches above the soil, when water is restricted to every fourth or fifth day which must be continued until the rains set in and after they have ceased or the cane be ripe to cut, which takes place just immediately prior to its coming into flower, a period of about twelve months from its being first planted. The crop has to be weeded about four or five times, and in the rains when all vegetation gets rank two or three plants are bound together by their lower leaves for support to each other in high winds. There are two varieties of cane grown, the red and white sorts. The former is called "Domeah," the latter Kurree. The domeah is the kind generally seen; it requires more manure than the other variety, yields a richer and more abundant extract, and from its drier nature, is better adapted to stand the climate found upon the high lands. They are however both generally to be found growing together in the same plantation, on account of the red kind some times spoiling by excessive cold, in the early part of the year, which does not, in the same degree, affect the white variety.

Upon an average, a beegah of good sugar cane land yields from four to seven pullahs of rub, or pot extract. Further consideration of this subject will be deferred till we come to treat upon the manufactures of the Circar.

Tobacco. No very fine varieties are raised: it is more cultivated in Byzapoor and Phoolmurree than elsewhere, preferring a rich reddish brown soil in these localities; at other places it is seen on the outskirts of villages, providing the "Forica" for the inhabitants. The land is little dressed for this crop, the surface soil only being once moved by the bukkur, previously to the young plants being planted: it requires one weeding and, as it is coming into flower, the tops of the plant are nipped off, which causes the leaf to be of better quality; a species of cricket is apt to destroy the tender plants, and the growing crop is much injured by a pernicious parasite infesting its roots called the Orobanche Indica.

There are 2,122 beegahs 16 pds. under cultivation producing 561

pul. 1 md. 30 srs. and yielding a return of rs. 6,236-13-3 at the rate of 11 rs. 0 as. 9 p. per pullah.

The weed is prepared for market as follows: the matured leaves are plucked, and spread out in layers in long beds upon the ground, where they remain for ten or twelve days; after which they are turned over, and continue so exposed for another like period, when they receive, on the last day, a plentiful sprinkling of water, administered morning, noon, and evening; before the sun rises the following morning they are all gathered up and piled in heaps, having heavy weights placed above to flatten them down, and in this condition they are allowed to ferment for four and five days, when the weights are removed, and the heaps opened, the leaves are then freed of their stalks, and smoothed into bundles, weighing from two to four seers each. The class of people who follow this business are generally bearers.

Rice. This grain is very sparingly cultivated in all the districts, and, generally speaking, is of a coarse and large description, reckoned extremely indigestible by the natives; an exception however occurs to this in the kind grown at Durungabad, which is fine and small, and considered of a very superior description. This cultivation is mostly found in the largest quantities at Untoor, Saitoonda, Phoolmurree and Koottabad. It is planted out in beds during the rains, which are flooded every eight or ten days; the land having previously been prepared by ploughing and manuring, fifteen cart loads of manure being given to every beegah. It requires weeding three times, whilst the crop is growing, and is ripe in six months. It requires ten or eleven seers to sow a beegah.

Rice lands occupy 4,149 beeg. 9 pds. and return a produce of 2,160 pul. 1 md. 5 srs., yielding 10,044 rs. 6 as. 4 p. at the average rate, 4 rs. 10 as. 4½ p. per pullah.

Tour. This grain is generally sown as a mixed crop, though not invariably so: on this account there will arise some difficulty in assigning to this and all mixed crops, the correct amount of land occupied. It is necessary to mention this circumstance as the district officers forward to me their statements of the produce, as though they were unmixed crops, and are therefore given by me according to their calculation. In Walloog and Gandapoor this very useful pulse is raised in rather large quantities, the soil being there well adapted for its culture, being light and rich.

There are 19,113 beeg. 13 pds. of this cultivation, producing 5,009 pul. 1 md. 10 srs. and yielding 23,672 rs. 12 as. 3 p., rating the average price of one pullah at 4 rs. 11 as. 7 p.

Kuldee, Carthamus Tinctorius.

Much of this is grown, and very frequently as a mixed crop, it succeeds well in the rich soils of Phoolmurree, Untoor, and Gundapoor, where it is extensively cultivated.

There are 18,648 beeg. $14\frac{1}{3}$ pds. occupied with this plant, the produce of which is 6,602 pul. 0 mds. 24 seers, whose value is 22,294 rs. at the average rate of 3 rs. 6 as. 0 p. per pullah.

Hemp.

Little of this is grown as an article of export, excepting at Phoolmurree; in many places only cultivating sufficient for the wants of the district. There are 3,457 beeg. under cultivation, producing 1,045 puls. 2 mds. 20 srs., the value of which is 7,045 rs. 7 as. 5 p. at the rate of 6 rs. 11 as. $8\frac{1}{2}$ p. per pullah.

The above are the principal staple productions. In closing this part of the inquiry, I will briefly notice one or two articles which are not of sufficient note to be thus rated.

Opium.

There are 936 beeg. $12\frac{1}{4}$ pds. employed for raising this article the produce of which is 11 puls. 2 mds. $1\frac{3}{4}$ srs. yielding 8,621 rs. 2 as. 11 p. as its value, rating the seer at 6-2-$3\frac{1}{2}$. It is grown in the largest quantity at Untoor, and Phoolmurree.

The poppy requires the richest sort of land, and constant irrigation. It is planted towards the close of the rains, and comes to perfection in four or five months, during which period it receives the unceasing attention of the ryot. The sites for its production will generally be found in the valleys where running streams abound, as well as richer and deeper soils. The same system of preparing the land is adapted as that observed for sugar cane. The land is either divided into furrows, or small plots, and sown and watered once in four days for the first fortnight: from that time till it flowers, which it does in another six weeks, it is watered but once a week, and, after flowering, only once in eight days. After the plants have sprung up, they are thinned out, leaving a hand's breadth between each, and are well weeded once a month. In about three or four month's time, the capsule will have reached the most favorable period of yielding its

juice, and on the falling off of its petals the operation of wounding them is commenced, which is effected by a three-pronged sharp pointed instrument, whose points cannot pass beyond a certain depth, and just sufficient to penetrate its outer covering : the incisions are made longitudinally, and in the heat of the day : during the night the juice exudes which is removed on the following morning with a blunt iron scraper, and put into a small shallow brass saucer : the scraper as well as the thumb and finger are occasionally rubbed with linseed oil to prevent the gummy juice from adhering. Each day's gathering is thrown into a common receptacle, where it is well saturated with linseed oil, to prevent its evaporation, as well, no doubt, as to add to its weight hereafter.

The seeds are sold as an article of food, but are not made available for oil in this part of the country, though they yield as much as one-third of their weight. They fetch one rupee for 11 seers.

The cultivation of opium is said to have greatly decreased during the last five or six years, owing to disagreements between the farmers and the subordinate agents of the Revenue Collectors, so that its culture now barely remunerates the grower, in place of producing one of his most profitable returns.

Cotton. Only grown in small quantities at Saitoonda Havalee, Hurşool, and Untoor ; the whole amount being 527 beeg. 13 pds. producing 213 puls. 0 mds., 20 srs. at the rate of 6 rs. 0 as. 5 p. per pullah, yielding 1,284 rs.

Turmeric. This is raised no where but at Poolmurree and Saitoonda, and in no large quantities. There are 49 beeg. 12 pds. thus occupied producing 30 puls. 2 mds., giving a return of 413 rs. at the rate of 13 rs. 8 as. 0 p. per pullah.

Fruit. The returns under this head exhibit 324 beeg. 1 pd. as so employed, yielding 269 puls. of fruit, and realizing in the aggregate 2,502 rs. 1 a. This comprehends grapes, oranges, figs, and mangoes.

The vineyards are principally found in the vicinity of Aurungabad, Kunhur, Rouzah, Sooltanpoor, and Padlee. The vine, like the orange tree, evidences a moiety of those incidental blessings that always accompany, and tend to mitigate the evils of war, in the early history of a people ; for conquering nations have ever been the means by

which vegetable productions have been widely and rapidly disseminated over the globe. The grape, originally confined to Syria, has now a very extended range, but it requires certain physical peculiarities of soil and climate, to ensure the due perfection of its fruit, which under favorable circumstances, are obtained in these light basaltic soils. Cow-dung is the manure employed, which is found to be sufficiently azotised for the purpose, and applied in March, when finished bearing. The vines are then pruned, and the soil opened up by the bullock hoe: a second crop of an indifferent description, comes on during the rains, which is called the sour crop "Khutta bhar," and is only used for making vinegar: after this, the vines are again pruned and slips set to strike. Weeds are kept down by occasionally using the bullock hoe, which also exposes the soil to the action of the air. The vines are planted six feet equidistant from each other, and trailed over props of the pangara (Erythrina Indica) which are kept pollarded for the purpose, water is given once in eight days, a plantation is supposed to reach its prime in five years, and will continue bearing for thirty. The produce is sold generally by the crop, to dealers for exportation to Bombay, Poonah, Nuggur, Malligaon and Jaulnah. The better varieties as the hubshee and sybee fetch one Chandore rupee per three seers. The fuckree sell at 21 seers for the rupee and the bokree cheaper still.

Melons.

Musk and water melons are grown during the hot months in the sandy beds of the river, the plants are put down at the end of February, and will be ripe in April and May. The manure found best adapted is night soil, but where that cannot be procured cow-dung in a liquid state is used.

Prices of principal Products.

The prices of produce fluctuate with seasons, more observable in dry grain than with any other commodity. Living from hand to mouth, the ryot is very seriously affected by every unusual rise or fall in the value of produce. A season of overabundance glutting the markets, is to him equally as unfavorable as one of scarcity, for he cannot wait for the markets to improve, but is compelled to sell under his accustomed profits in order to make good the payments of his kists, now falling due at harvest time. The overstocked markets are taken advantage of by grain merchants to fill up their under-ground vaults or "pews" as

they are called. During the preceding four years, little rain had fallen, producing in each succeeding year, a gradual rise in the price of every article of produce: dry grains, as usual, advancing beyond all others, doubling and trebling their original rates in that period. In the Appendix will be found a detailed statement of the range of prices of the principal products throughout the Circar for the last seven years, inclusive of the present one.

Tenure and Occupation.

In elucidating the complicated question comprehended under the head of tenures, so much matter of a conflicting and perplexing nature presents itself, that rather than hazard crude notions involving doubt and uncertainty, it has been deemed prudent to defer all remarks upon the subject, till more extended observations may have tested the value of the information obtained, and placed me in a position to give the results of my inquiries with that degree of confidence the accurate nature of the duty requires.

With respect to the cultivators, they are divided into two classes, the Meerasdars or Wuttundars, and Ooprees.

The Meerasdar holds lands in fee enjoying the usufruct of the soil, conditionally, that he renders to Government a stated amount of the produce of his labors, rated and fixed in conformity to the extent, and qualities of the soil.

The Ooprce is merely a tenant at will, occupying lands not his own, temporarily from year to year upon agreement.

Enams, gifts of land to charitable and religious purposes: and Jagheers, the gifts to military and civil officers of the state, have their revenues permanently alienated. The system observed in the management of these lands, is the same as that followed in the Circars, with this exception, that measures are seldom pushed to such extremities by Enamdars or Jagheerdars, from their possessing a permanent interest in the welfare of the people and improvement of the soil: the policy of such forbearance is visible in the superior condition of the land, cattle, and implements as well as the meliorated state of the ryots themselves.

Modes and Rates of Assessment.

The rates of assessment at the present day have become mere arbitrary arrangements, giving rise to a very irregular and unsatisfactory system, in which one party by endeavoring to exact all he can, and the other resorting to every expe-

dient, to pay as little as possible, produces endless confusion and embarrassment to all concerned. Though the rule of guidance in the adjustment of Sevies is professedly that which has obtained in former years, yet it is often departed from ; for should the amount of revenue fall short of the required sum, or the season prove particularly abundant, a Jastee Puttee is levied, whilst on the other hand, it must be mentioned, that Government often remit the dues in time of public calamity. Should it so happen that the ryots refuse to comply with the increased demands made upon them, and coercion be resorted to, they immediately desert their fields and villages ; an extremity which quickly brings about an understanding between both parties.

The total revenue upon a village is rated at three seasons according to the nature of the crops, viz., the *toossar*, *khurreef*, and *rubbee*, and a portion is taken at each harvest. At the toossar, which is generally a small harvest, a small kist is taken ; if the khureef forms a larger portion of the whole produce, the amount levied is proportionately large, and is taken in two kists, the first when the grain is ripe (and the payment of a kist is required, before permission is given to reap the grain) ; the second kist is taken before the kullees are allowed to be opened : the remaining portion of the revenue is payable upon the rubbee crop, and is also taken in two kists which are paid in like manner before the crops are reaped, and the kullees opened ; and should the rubbee harvest be of a more valuable nature than the khureef, the kists taken at this period are the largest.

An arrangement having been entered into between the Mamlutdar and the Patels for the settlement of the year's revenue, seebundies are sent by the former to the latter, to aid them in collecting the dues from the ryots at the several harvests ; and should any ryots refuse to furnish his quota, he is put under custody of a seebundee, to whom he is obliged to furnish daily batta, until he pays the demand made upon him : if this proves unsuccessful, harsher measures are adopted, amounting to personal violence and confinement, and eventually to the sale of all he is possessed of, should he still persist in his contumacy. When the crops run a risk of spoiling by too long standing, pending difficulties in the way of realizing the demands of revenue, the Government reap the fields, and appropriating its own share give over the remainder to the owners.

Labor employed, and Remuneration. Where the families of the ryots prove insufficient for preparing the fields and gathering in the harvest, laborers are engaged, who are paid either by wages of money, grain, or, in some instances, merely providing subsistence and clothing. The daily pay to a man for ordinary work is from three dubboo pice to three pice and a half; to a woman, two pice, and to a boy or girl, one pice and a half; working from sunrise to sunset, and resting at noon. Those laborers employed at the sugar mills, receive their hire partly in money, and in the produce of their labor; those who drive the bullocks and supply canes to the rollers receive one pice daily, and three quarters of a seer of goor, whilst the person who brings the fuel has nothing beyond his maintenance and clothing.

Rivers. The principal rivers of the Circar have their origin amongst the range of hills, and are named the Poornah, Sewna, Geerja, Ajnah, and Gunda, whilst the Godavery flows along the south-west boundary.

These rivers run in different directions: the Sewna and Gunda in a southerly course to fall into the Godavery, and the Geerja, with its innumerable streams, into the Poornah, that passes away in an easterly direction: the beds of all are, for the most part, rocky and shallow, and some contain water the whole year round; in the rains these streams become occasionally rapid torrents, laden with fine alluvial matter, washed from the under lying rocks they rise from, and affect the agricultural capabilities of the soil, in the manner before alluded to.

The Godavery flows along the south-west edge of the Circar for fifty miles in a very tortuous manner, in consequence of the flatness of the country; its many feeders from the hills, cause a rapid rush of waters to take place in the monsoon, when its alluvial depositions are sometimes so great as to threaten new channels being formed for the bed of the river, a circumstance that actually occurred about twenty years ago at the debouchement of the large stream that flows from Byzapoor into the river bed. The banks are sometimes seen to be very precipitous and deeply cut by water courses; the bed rocky, but sometimes covered to a great extent with sand, and varying in breadth from two to three hundred yards. At Toka the Bombay road crosses, and as an impetuous stream always sweeps

by during the rains, the Bombay Government have provided a broad and convenient ferry boat for the use of the public.

The two rivers emptying into the Godavery, are the Sewna, and Gunda.

The Sewna has its source below the Paidkah hill fort and proceeds first easterly to Khunnur, where it takes a turn to the southward, passing through an extensive tract of country, depositing large beds of rich soil in its course to the Godavery, which it falls into below Sownkhair.

Generally speaking its banks are low, though occasionally seen rising to a height of forty or fifty feet and precipitous. Shortly after the rains, the stream becomes very shallow, and sometimes is lost amidst the immense quantities of alluvial matter obstructing the bed.

The Gunda river rises below the hills close to Russoolpoorah and Mousalla, passes easterly for some distance, when joining with a large stream from Hursool, unites to form a broad shallow sandy bed, and proceeding past the city of Aurungabad, unites itself after a very winding course, with the Sewna in the Pytun Purgunnah.

The important Poornah river has its sources amongst the higher ranges to the north of the Circar, near the base of the Gowtala ghat, a mile and a half west of the small village called Mahone, in the Untoor Purgunnah in longitude 75° 14′ 51″ east, and latitude 20° 23′ 50″ north. Its banks generally rise from twenty to thirty feet above the bed of the stream, which here averages at the broadest parts, about 150 yards from bank to bank; the bed generally rocky, and retaining water in jheels the whole year round. The course it flows is easterly, through a valley upon which it exercises the most important influence, visible in the luxuriant freshness of its vegetation.

The next river is the Ajnah that rises near the village of Tuphone, in the Untoor Purgunnah; takes a south-easterly course for several miles, and unites with the Poornah, south-east of Sissar Khair. Like the Poornah, this stream spreads beauty and abundance, over the valley it meanders through.

Passing southward, we arrive at the Geerja, which is a river of some importance; rising in the Byeemuhul hills, and running easterly, receiving in its whole course, streams, from the ranges extending north and south of it, and with their united waters join the Poor-

nah in the Jaulnah Purgunnah. Its banks are rugged, and the river bed very rocky, retaining water the whole year round.

The whole country is covered with dilapidated tanks. Bunds or bundaras, aquaducts, baolees, and draw-wells.

Tanks.

Upon the plateau above the fort of Dowlutabad, are to be seen a series of tanks, in the construction of which infinite labor must have been employed. In the vicinity of what is supposed to have been the site of the ancient city of Boodra Vuntee, or Bhoodda Vuttee, these noble works are principally to be found; and are no doubt the undertaking of the inhabitants of this once mighty city, though now assigned to the Toghlak kings; the probability being, that the latter only repaired, or enlarged what they found existing. The Toghlak kings, who performed these meritorious acts, were Sultan Ghias, his son Sultan Mahomed, and Sultan Feroze, the nephew of the latter; the memories of whom are to this day venerated by the Koonbees as the Toghlak Padshahs, protectors of the cultivators.

The tanks ascribed to Sultan Mahomed are the following. The Kootloogh Talow, a fine sheet of water when full, and faced with masonry and steps, having a summer palace, upon its banks, it is situated to the east of the village of Monsalah, and is called after the Sultan's tutor, Kootloogh Khan, who was Governor of the fort of Dowlutabad at the time.

The Purree ka Talao or as it is variously termed Rajah Yunas ka Talao, and Gungeerow ka Talao, the latter name being given to it on account of the Peer Gungeerow's tomb standing on its banks, is one of the tanks that were probably repaired, and not built by the Toghlak Sultan; it is of large dimensions, faced with stone steps on three sides, with an average depth of 70 feet and nearly 2000 yards in circumference, the bund which confines the water is 210 feet in breadth at top, and is thrown across a deep ravine; a broad flight of forty steps leads to the water on the north side, with a smaller one upon the south; it is fed by subordinate tanks, that have been formed towards the hills for this purpose: one of which is made also to supply the town of Rouzah by a line of under-ground pipes, leading from it. Tanks formed without cement as this is, are termed Ahmar Punty tanks, from the circumstance of the Pundit Ahmar causing many of this description to be made.

Besides these two, Sultan Mahomed Toghlak made the Doodeah ka Talao, a small tank at the foot of the Lambgaon ghat; a stone faced tank at the north-west entrance to Rouzah, and five others in its vicinity, all of which appear to have been formed for the convenience and necessities of the colony he had twice planted on these heights, when removing the whole population, as he did from Delhi, on two several occasions.

Near Elloora, a fine tank has of late years been repaired by Government, and affords the means of irrigation to a very fertile tract of land. Outside the northern gate of this town, stands the beautiful stone koond constructed by the amiable Alac Bae, the mother of the Holkar of the day and grandmother to the present one. The spring that here rises, is supposed to possess miraculous properties, and to have cured the Rajah Eloo of his leprosy; in gratitude for which, he is said to have excavated the remarkable temple of Kailas, in the neighbouring hills. This most excellent Princess, whose life was devoted to acts of philanthropy and piety, has built many wells and baolees in this part of the country, for the use of the wayfarer.

In the valley watered by the river Geerja, in many places are to be seen the magnificent remains of former aqueducts and bundaras; more especially about the neighbourhood of Sooltanpoor. Tradition assigns these works to Sultan Gheias ood deen Toghlak. Judging from their present ruinous condition this system of irrigation must have been very long abandoned.

Irrigation.

Irrigation may be regarded in the light of an elegant mode of supplying manure, the fertility of soils mainly depending upon the quality and quantity of water, employed for this purpose, impregnated as it is with mineral and vegetable matter. In these districts the attention of the earlier Mahomedan conquerors had been directed specially to the effectual, and ample supply of this essential element; the traces of these useful works are still visible, scattered about the country, indicating the munificent spirit that formerly prevailed, nor are such undertakings to be lightly considered in countries like this, subjected to uncertain monsoons, and possessing but a shallow soil. Artificial irrigation converts the ordinary lands producing but single crops of common grain, into those giving three, and of the richest description. The mode by which the mountain streams were made available for purposes of irrigation, was

to build a bund of solid masonry across the bed of some nullah favorable for the purpose, of which there is no want of selection, and to diffuse the pent up waters over the surrounding fields, by the means of channels constructed for the purpose. The bund built across the nullah is called a "Bundara," and the channels "Phats," it is necessary to form smaller bunds in these channels, to divert the water on the various lands, and they are termed a "Barra." These works are undertaken at the joint expense of the cultivators, who in their turns enjoy the benefit: the whole management is under the charge and control of a Seebundee.

The plan followed for raising water from draw-wells, is the usual one by mhote and bullocks; two wheels may often be seen working at one well.

It is not usual for the Circar to build wells, those existing have been formed by private individuals, an encouragement to undertake which is sometimes offered by holding out the privilege of "Meeras" to all such as do; or allowing lands which it waters, to be continued assessed as jeraet for a specified term.

The expense of erecting a well of the better description, lined with bricks, and supplied with stone copings, will cost on an average about rupees two hundred and fifty, those of an inferior kind from one hundred, to a hundred and fifty rupees.

The repairs of a well are undertaken by the cultivator, but should he be too poor to raise the necessary funds, Tuccavees are granted by the Circar; beyond this, no other assistance is afforded the Koonbees by Government for irrigation. The village tank and wells, are kept in repair by the community at large.

Cities, Towns, and Villages.

The Circar is divided into Purgunnahs, each composed of a certain number of towns and villages, called Turrufs. The division comprehended under the head Talookah is only known in the Purgunnah of Untoor.

Shehr, is the term applied to the city; *Kusbah*, to the market town; *Thanna*, to the town where the Tahseeldar resides; *Mouza* or *Gaon*, to the village; *Barree* or *Warree*, to the hamlet; and *Poora*, to the suburbs.

Havalee, is the term given to the household lands of Government, and were generally districts in the vicinity of large towns, and an-

nexed thereto originally for the supply of the military and civil establishment of the Mahomedan Government.

All the towns and villages are surrounded by walls of stone or mud, many of which are much out of order, but if repaired, are sufficiently strong to protect the inhabitants from common marauders. The walls are usually flanked by towers, and not unfrequently further protected by cavalier bastions. In the centre of the village a square building, generally of brick, is seen, with its walls pierced for musquetry, and having but one entrance, this is the Patell's house, and forms a sort of citadel to the village in cases of emergency.

The form of the houses vary throughout the Circar, according to circumstances: those on the lower plains, being more inclined to adopt flat terraced roofs, which are made of mud amongst the poorer classes, and chunam in the houses of the rich; whilst on the higher lands, pent roofs prevail; the better kinds being tiled. On the whole the inhabitants appear comfortably lodged.

My limits do not allow of very detailed descriptions of towns and villages, I will therefore confine my observations chiefly to the notice of the principal ones of each Purgunnah, whose population exceeds 500 souls, merely offering remarks in a fuller manner upon a few, whose importance require it. Proceeding therefore to the notice of this question, I shall commence with Aurungabad, but having fully treated already of this city, little beyond a passing notice will now be required.

Aurungabad is the residence of the Soubah, and a station of the Nizam's contingent. Its population about thirty years ago were computed at 100,000;* according to my calculations made from a very careful enumeration of houses, I estimated the whole in round numbers at 40,000: 4,199 pucka houses, varying in size from four stories to one, and 2,932 kutcha houses. In computing, five persons were allowed to every single storied house, and four to every story exceeding this, which in the aggregate gave 5½ souls to a house; with this serious falling off in the population, there will be found of course, a similar declension in the prosperity of the city, for in lieu of there being a thousand looms at work, as was then the case, manufacturing costly brocades and silks, the annual worth of which was estimated at about three lacs, there are now but sixteen for brocades,

* Sir Henry Russell's report on the Nizam's Dominions.

and forty for silks, the united value of which does not exceed 80,000 rs. The havalee villages attached to the city amount to 39, with a population of males 1,235, females 1,029.

Hursool. A dilapidated kusba town, situated two miles N. E. of Aurungabad. It has bunniah shops 1, pucka houses 3, kutcha houses 105, and a population of males 304, females 275. In the flourishing periods of Aurungabad this town was largely populated : its magnificent surais, crumbling mausoleums, ruined garden houses, and rouzuhs, afford sufficient evidence of its former prosperous condition. Its principal towns are Chikultana ; bunniah shops 6, pucka houses 12, kutcha houses 216, males 1,076, females 515. Chowka and Nourbarree ; bunniah shops 5, pucka houses 5, kutcha houses 204, males 456, females 398 ; and Burrood, kutcha houses 139, males 385, females 380.

Sittara. A small kusbah distant 3 miles south of Aurungabad ; bunniah shops 6, pucka houses 51, kutcha houses 21, males 309, females 288.

Wallooj. A kusbah of some importance 8 miles south-west from Aurungabad ; bunniah shops 16, pucka houses 11, kutcha houses 147, males 583, females 538. Its principal towns are Ranjungaon khurree ; bunniah shops 9, pucka houses 3, kutcha houses 118, males 356, females 232. Toorkabad, formerly the kusbah of a purgunnah but now united with Wallooj ; bunniah shops 18, pucka houses 8, kutcha houses 90, males 410, females 261.

Gundapoor. A considerable sized kusbah. It is situated 28 miles south-west of Aurungabad, containing bunniah shops 20, pucka houses 82, kutcha houses 355, males 1,221, females 1,129. Its principal towns are Lassoor, pleasantly situated on the banks of the Sewna river ; bunniah shops 43, pucka houses 78, kutcha houses 189, males 731, females 740.

Amanoollabad. Bunniah shops 3, pucka houses 93, kutcha houses 36, males 357, females 359. Kaigaon ; bunniah shops 8, pucka houses 3, kutcha houses 105, males 508, females 394. Sewur kusbah with nine barrees attached ; bunniah shops 28, pucka houses 17, kutcha houses 419, males 1,205, females 1,100.

Garra Peepulgaon. Bunniah shops 20, kutcha houses 117, males 298, females 242. Bhervahanora ; bunniah shop 1, kutcha houses 86, males 255, females 248.

Byzapoor. This kusbah is situated upon the borders bearing 40 miles west of Aurungabad, a very considerable trade is carried on in the fabrication of silk goods, employing 125 looms, and 10 winding machines, besides 50 looms for cotton cloths with silk borders, for sarees; the estimated worth of which is from forty to fifty thousand rupees: the goods are principally disposed of at the great Mhyjee fair. Bunniah shops 141, pucka houses 575, kutcha houses 403, males 3,338, females 2,061. The principal towns are Boresur; bunniah shops 14, pucka houses 2, kutcha houses 115, males 437, females 383. Nawurgaon; bunniah shops 8, pucka houses 10, kutcha houses 103, males 341, females 244. Mahkalivargaon; bunniah shops 4, pucka houses 5, kutcha houses 66, males 250, females 255.

Khundalla. A kusba town situated 38 miles from Aurungabad in a north-west direction; bunniah shops 17, pucka houses 5, kutcha houses 196, males 444, females 390.

Khanapoor. A kusba town distant 24 miles north-west from Aurungabad; bunniah shops 6, pucka houses 12, kutcha houses 159, males 440, females 398.

Elloora. A large kusba two-thirds dilapidated. It lies 16 miles north-west of Aurungabad; bunniah shops 9, pucka houses 93, kutcha houses 88, males 605, females 623. It possesses only one town of any note, Kussaibkhaira; bunniah shops 60, pucka houses 12, kutcha houses 194, males 645, females 511.

Havaleè Dowlutabad. The ancient city of Dowlutabad is situated 8 miles north-west of Aurungabad: this interesting locality once the seat of a long line of Hindoo kings, and then known as Deoghiri, is at present nothing better than a miserable cluster of mean huts forming the pettah of the fortress. For any information concerning its earlier history, we are more indebted to tradition, than to historical records, the first time it became known, being in 1294, when Ala ood Deen surprised and captured the citadel. It owes much of its importance to the Emperor Toghlak Mahomed, whom Ferishta describes as being one of the most accomplished princes, and at the same time the most furious tyrant that ever dignified or disgraced human nature; he it was, who entertained the wild project of removing the capital of the dominions from Delhi to the Deccan, by commanding

the inhabitants to depart with all their families and wealth to Deoghiri, and in 1339, the year this event took place, its old name gave way to Dowlutabad, its present one. He erected handsome palaces within the walls and dug a deep ditch all round. Twice the inhabitants were permitted to return to Delhi, and twice compelled to return again, on pain of death. It continued to be the capital until A. D. 1616, when Malik Amber removed the court to Aurungabad, since which period, though lessened in importance, it yet continues to be regarded with jealous anxiety, on account of the nature of its natural and artificial defences, which are very peculiar. A weak wall surrounds the pettah, beyond which, three walls, with gates, are to be passed, before the inner fastness is gained. A narrow causeway crossing a wet scarped ditch, leads to the low entrance of this remarkable stronghold; after which the ascent continues for a considerable distance along a winding gallery, hewn out of the heart of the rock, the nature of which being amygdaloid trap, and not granite as some writers erroneously state, it is readily worked. The upper outlet has a contrivance for securing its mouth in the shape of a huge iron grating which can be laid on, and a fire being kindled upon the bars, would effectually arrest the approach of any assailant from below. The principal objects that arrest attention on looking down from the pyramidal hill on which this fortress is built, are the ruined muhal of Toghlak Mahomed, the governor's house and garden, and the lofty minar built by Ala ood Deen. The handsome building, close upon the summit, was a summer residence of the Emperor Shah Jehan, and crowning the pinnacle is a broad platform, on which a large piece of ordnance is mounted, above which is the flag-staff, bearing the standard of the Nizam. Cisterns of excellent water are hewn out of the rock causing no scantiness of this supply. The prickly-pear, and rank vegetation, have made the inner fort a perfect wilderness, and is in consequence very unhealthy after the rains. It may be remarked, that soils on which the prickly-pear is found are generally those on which the grape will be found to thrive, as mount Etna, for instance, and many other parts of Italy; here the vines are particularly flourishing, as well as other kinds of fruit, figs in particular. The principal towns in the Havalee Dowlutabad are Rouzah and Kaghuzpoora.

Rouzah lies five miles north of Dowlutabad, and twelve from Au-

rungabad in a north-west direction. It is surrounded by a handsome stone wall, erected by Aurungzeebe, but though the houses are substantially built, two-thirds are dilapidated and in a falling condition. The materials for constructing this town as well as Aurungabad, Jaulnah and many of the large tanks on the high table land, were obtained from the ruins of the ancient city of Bhoodda Vuttie, situated on the narrow table land between Rouzah and the Dowlutabad ghat. Rouzah, as its name would imply, is a burial place, and famous as containing the ashes of two Mahomedan saints, Boorawn-u-Deen, and his brother Zer buksh; besides many other holy men, whose tombs have sanctified the spot, and caused it to be regarded by devout Mahomedans, as a Necropolis of peculiar sanctity. There are about thirteen goombuz or domed tombs,and about 1,400 without such buildings. Within the walls of the town are seen the plain tombs of Aurungzeebe and his grandson, Azeemoolshaw, in the same enclosure along with Zinoolhuk Saib, the spiritual adviser of Toghlak Mahomed: close by are those of the Nawab Azif Ja, and Naser Jung, his son. Upon the north of the town, and a short distance from the walls, several goombuz or domed tombs are standing, the principal of which are a large one to the west containing the body of Nizamshah Byree, one of the last kings of Ahmednuggur. The next largest eastward is the tomb of Malik Amber, the greatest financier of his times, and minister to the Ahmednuggur Padsha Moortuzza; near to it stands the goombuz of his wife Beebee Kurreema. A remarkable looking goombuz under the hill, was built by Khoja Feroz for himself, when superintending the erection of the large tomb of Nizamshah Byree his master: several others exist but none, I believe, of any note or consequence. The revenues of several villages are set apart for the purpose of keeping up the repairs of these tombs. There is very little trade in the town; sugar of good quality is made in one or two houses, and a few sarees of silk and cotton. Savaye, a description of vermicelli, is also peculiar to the town as an article of trade. Bunniah houses 32, pucka houses 416, kutcha houses 59, males 1,574, females 1,511.

Kaghuzpoora. A village of large size, the inhabitants of which are exclusively engaged in the manufacture of paper: it lies midway between Rouzah and Dowlutabad. Bunniah shops 8, pucka houses 42 kutcha houses 91, males 605, females 623.

Kooltabad. Burrood, contains a few good houses. It is situated 28 miles north from Aurungabad; bunniah shops 2, pucka houses 32, kutcha houses 69, males 261, females 242. Golagaon; bunniah shop 1, pucka houses 12, kutcha houses 42, males 284, females 235. Kherdee, one of five villages given in enam for the preservation of Aurungzeebe's tomb. Bunniah shop 1, kutcha houses 131, males 283, females 224.

Sooltanpoor. The kusba town of Suttanpoor is in a very dilapidated condition, never having been repaired since it was sacked and burnt by the Pindarees. There are some vineyards at this village. The revenues are appropriated, with six other villages, to the repairs of tombs at Rouzah. Bunniah shop 1, pucka houses 2, kutcha houses 35, males 132, females 114. Gunnooree, an agreeable locality, 22 miles north of Aurungabad. Is held in Enam along with two other villages, for the maintenance of the fort of Dowlutabad. It was a favorite resort of Aurungzeebe, and was held in jagheer by one of his daughters, who planted avenues of mango and tamarind trees around the town, and also sunk wells at intervals upon the road towards the city. A ruined garden house marks the site of the royal abode; a large tank amongst the hills upon the south was built by Syud Budeozam, the patel in Aurungzeebe's time, which is still in good preservation, and at a little cost might again be made available for irrigation. He also built the Surai outside the town, and another above the pass leading to Aurungabad. Sugar cane of a very superior description is grown around the lands of the town. Bunniah shops 23, pucka houses 10, kutcha houses 131, males 524, females 446.

Kingaon, a village famous for its sugar-cane lands. Bunniah shops 10, pucka houses 104, kutcha houses 51, males 623, females 305.

Guddana. Excellent soil for sugar-cane. Bunniah shops 9, pucka houses 11, kutcha houses 82, males 293, females 290.

Taklee. A large kusba town situated in the valleys about 24 miles from Aurungabad in a north-west direction. It has some good houses, and seems to have once been a town of some importance. Bunniah shops 19, pucka houses 5, kutcha houses 201, males 597, females 555.

Sangnee, a town of some note : a juttra is held here once a year. Bunniah shops 10, pucka houses 3, kutcha houses 190, males 434, females 354.

Dhamungaon. Bunniah shops 3, kutcha houses 98, males 263, females 265. Dhurragaon, bunniah shops 3, pucka house 1, kutcha houses 109, males 259, females 298.

Phoolmurree. A large kusba town situated on the banks of the Phoolmusta river, amongst large topes of mango trees. It is 16 miles N. N. E. of Aurungabad. In the neighbourhood are many remains of ancient hindoo temples, the ruins of which have been employed for constructing the town walls, gates, musjeds, and peers shrines. The figures and designs are all clearly and neatly cut, principally representations of Mahadeo and his consort. At the south gate, which is in ruins, a stone with a long inscription in Sanscrit is observed, nothing of which can be decyphered but the date in which the temple it belonged to was built, viz., 1166 of the Hindoo era, agreeing with A. D. 1244, half a century prior to the first Mahomedan invasion. A large town called Veerdar or Beeldar, was formerly existing within a couple of miles towards the south ; nothing now remains but the gate-way. The soil around is remarkably fertile, yielding sugar-cane, and every description of vegetable produce, in the greatest perfection, with the exception of the vine, which cannot be cultivated on account of the destruction occasioned by white ants. Bunniah shops 66, pucka houses 36, kutcha houses 487, males 1,683, females 1,533. Babra ; bunniah shops 97, pucka houses 12, kutcha houses 403, males 1,084,females 1,067. Waragaon ; bunniah shops 11, pucka houses 3, kutcha houses 183, males 445, females 413. Khamgaon ; bunniah shops 7, kutcha houses 206, males 386, females 390. Khaigaon ; bunniah shops 3, kutcha houses 169, males 399, females 376. Burrode Burra ; bunniah shops 9, pucka houses 3, kutcha houses 151, males 307, females 293. Peerbowdee ; bunniah shops 27, kutcha houses 158, males 371, females 305. Dhamungaon, bunniah shop 1, pucka houses 4, kutcha houses 161, males 323, females 299. Woomrowtee ; bunniah shops 2, kutcha houses 129, males 274, females 268. Neellode ; bunniah shops 4, pucka house 1, kutcha houses 81, males 235, females 317.

Kunhur. A large kusba on the banks of the Sewna river, distant 33 miles north north-west of Aurungabad, formerly a station of the Nizam's contingent, and now the residence of the Company's Bheel agent. Vineyards and orange groves, are found in a very flourishing condition around its neighbourhood. Bunniah shops 66, pucka houses

149, kutcha houses 398, males 929, females 836. Andhanair; bunniah shops 5, pucka houses 2, kutcha houses 116, males 340, females 314.

Gowtala. This purgunnah contains only five villages, which, with the kusba, are all deserted excepting Dondgaon, a small hamlet of 8 males and 11 females.

Untoor. This purgunnah is delightfully situated amongst the hills upon the north, occupying two lengthened valleys, which are divided by a lofty narrow ridge, that is impassable for wheel carriages. The fort of Untoor is placed upon a narrow spur projecting into Kandesh; the form of the hill it stands upon is nearly square, and about a mile in circumference. A natural scarp of about 700 feet surrounds it on all sides, excepting towards the south, where it has been scarped by art. It was well supplied with water, and presents an excellent instance of a hill fort rendered impregnable, by its natural defences. It has a Rajpoot garrison, and a pettah containing about 12 houses. The plateau, extending between this fort and Nagapoor, is composed of disintegrated trap and porphyritic rock, presenting a very desirable site for a sanitarium. Undharee; the kusba town; bunniah shops 34, kutcha houses 288, males 698, females 617. Nagapoor, very pleasantly situated on the banks of the Poorna; bunniah shops 16, pucka houses 26, kutcha houses 213, males 615, females 590. Peeshoor; a large town on the banks of the Unjaina; river; bunniah shops 74, kutcha houses 279, males 690, females 638. Kurrung Khaira; bunniah shops 18, pucka house 1, kutcha houses 246, males 604, females 520. Pulsee Tiggee; bunniah shops 19, kutcha houses 127, males 699, females 616. Saindra; bunniah shops 20, pucka house 1, kutcha houses 198, males 415, females 387. Karulla Degruss; bunniah shop 1, kutcha houses 178, males 402, females 400. Urgaon; bunniah shops 8, pucka house 1, kutcha houses 109, males 285, females 236. Navepoor; bunniah shops 26, pucka house 1, kutcha houses 130, males 258, females 253.

Saitoonda. Kusba Ghatnaundra; bunniah shops 19, pucka houses 6, kutcha houses 316, males 814, females 754. Umbae; bunniah shops 33, kutcha houses 239, males 469, females 395. Umthana; bunniah shops 14, pucka house 1, kutcha houses 145, males 373, females 336. Davulgaon; bunniah shops 4, kutcha houses 199, males 331, females 306. Charnair; bunniah shops 5, kutcha houses 141, males

354, females 338. Ralegaon; bunniah shops 7, kutcha houses 108, males 295, females 266. Chicholee; bunniah shops 15, pucka houses 5, kutcha houses 101, males 245, females 333.

Roads and Communications.

From the variable nature of the face of the country the roads throughout the Circar are proportionately difficult for communication, though generally speaking they are pretty good, or might readily be made so, water seldom hanging, and the materials for metalling being close upon the surface; the greatest inconveniences are the occasional beds of black soil found in the lower levels, which render the roads impassable in the rains where they occur, and also the sides of the nullahs in the same localities, having banks of soft alluvial earth rendering in such cases even passage for bullocks a difficult matter; however towards the hills, a rocky shallow soil prevails, on which carts may travel the whole year round. If the hill be hugged too closely, deep nullahs occasionally obstruct the road, but this inconvenience is easy of remedy at trifling cost, by sloping in and out, and paving the centre, with stones sufficiently large, to withstand the impetuosity of the hill streams.

Passes. The passes by which the higher plateau towards the north are gained, are through the Chowk ghat, a steep and rocky ascent passable for carts, leading to Phoolmurree. The Gunnooree ghat, passable for carts, and a winding stony and steep road up the side of the hill, leading to Gunnooree. The Dowlutabad ghat, a broad ascent of nearly half a mile, sufficiently easy until near the summit, when it becomes very steep; passable for carts, but not very generally used. Besides these there are two or three bridle roads, and footpaths, as well as another ghat at Elloora.

Upon the north-west there are four passes in what is called the Adjuntah, or Sat Malla range, all passable for carriages. These are the Adjuntah ghat not within the Circar. The Gowtala ghat, lately made passable for wheel carriages; the ascent though difficult for traffic, is easily managed with light loads, and has been much used since the repairs, that lately have been made. It may be kept in its present state, at no great cost, and is of great convenience.

The Purdaree ghat is a made one, and has a good and easy ascent for loaded cattle.

The Kussara, or Kassarbarra ghat, enters the Nuggur districts near the village of Waukly. This too, though not a made road, is a very good and passable ghat for loaded carts. About ten miles south of this pass, the Sat Malla range slopes away into the Nuggur country, and in so gradual a manner, as to permit a carriage being driven over it with ease. Besides these passes for wheel carriages, there are many along the range available for loaded tattoos and bullocks, and foot passengers.

Upon the event of a railway passing through Kandesh, the route it should adopt has been suggested as being one, that would command easy access to the principal lines of traffic from the Nizam's frontier, as for instance the cleared road from Nummaur to Mulcapoor, which is well suited for the purpose, being a good level bit of country: should this ever be accomplished, the ancient road from Aurungabad to Surat, will be the best line for the traffic, passing south of the Adjunta ghats, the remains of this old road are distinctly visible; in some places the pillars that marked its distances, are still standing. The tapal road from Bombay on entering the Circar at Toka, traverses a flat level throughout and consequently is much obstructed by nullahs, and heavy soil: the worst nullahs have a light wooden bridge thrown across them, sufficiently strong to allow the horse tapal to cross.

Population.

The census has been made from returns furnished by the Putwarrees of each town and village, the truth of which I am inclined to believe, though probably the estimate may be found rather under than over the real amount.

The scanty population of these districts arises from their having in former days been afflicted with several awful visitations of war, famine, and pestilence; the effects of which have been as disastrous as lasting; the greater part of those who did not fly the country perished through destitution, or by disease induced thereby; and where destruction of human life occurs to such a frightful extent, as has been witnessed within these districts, during the last half century, it takes many generations to restore the population back to its original strength.

Famines. The famines that have desolated the land during the last fifty years amount to four, indeed we may say five, for the scarcity prevailing in 1846, may fairly so be termed.
1787. The first occurred in 1787. Grain selling for nine seers the rupee. The second and most dreadful of
1802. all happened in 1802, fearfully aggravated by the horrors of war; the marauding hordes of Holcar, under Ameer Khan, having carried havoc and destruction through the country the preceding year, destroyed the harvest, and grain was sold at one rupee for a seer and a half; thousands perished from inanition, or fled; and so dire was the scourge that to the present day the revenue has never recovered the shock; whole tracts of valuable land then covered with towns and villages, are now lying desolate, which forty years ago yielded rich returns to Government. This is particularly the case between the Gowtala ghat and Byzapoor, but were I to particularize every locality thus impaired, I should have to name every town and village of any note,
1825. throughout the Circar. The third famine was in 1825: grain sold at 9 seers the rupee. The fourth was in
1834. 1834, and grain sold at 12 seers the rupee. The
1846. fifth occurred in 1846, when grain was sold for 15 seers the rupee, being just double the usual price. Much sickness prevailed amongst the poor in those districts, where the dearth was most felt; cattle dying in great numbers, and in many places the fowls have completely disappeared.

The gross estimate of the population amounts to 1,54,767, exclusive of the city of Aurungabad, of this 1,38,376 are Hindoos, and 16,391 Mahomedans; or one Mahomedan to eight Hindoos, and averaging 5 persons to a house.

In the abstract of the census there is shown a preponderance of males over females, a result in some degrée corroborative of its truthfulness, as such is found to be the case in all countries where the censuses have been accurately taken. In England the census of 1830, gave males to females in the ratio of 19 of the former to 18 of the latter; the returns here show something in excess of 88 females to 100 males, the respective numbers being males 82,075, and females 72,692, and here a curious circumstance is perceived in the fact that adult females bear a larger proportion to adult males, than girls do to boys, and that it is owing to the excess found in male children,

that the preponderance of the male sex ultimately takes place: as for instance, in every hundred men, there are 98 women, but in every hundred boys, there are but 71 girls. One way to account for this remarkable fact, may be explained in the custom that obtains in the East, of classing girls as women, at a far earlier period, than is the case in Europe. Respecting births and marriages, the prejudices of the natives prohibited all attempts at obtaining information under this head. The returns of deaths present a high rate of mortality, being 1 in 26: the average rate in Java is 1 in 40, and in England 1 in 51. This excessive mortality may have been the case, as the census was taken for the year 1846, which was one of extreme distress, occasioning much sickness of a depressing nature, cholera alone amounting to nearly the half of the casualties, small pox about a fifth, fevers a tenth, and other disorders about a third. Of the diseases incident to the inhabitants, fever as usual prevails most generally, and is often found of a serious nature towards the hilly country, or amongst the broken banks of ravines, which are generally depots of malaria; rheumatism, and spleen disease, are always rife in such localities. Blindness is a common calamity, generally arising from structural disorganization of the eye, the ravages of small pox, a disease that annually scourges the population to a very serious extent in common with cholera. Leprosy of the skin, is less common than in its more hideous form, affecting the joints. Guinea worm is occasionally seen, but is not common, neither is stone in the bladder.

The following table shows an analysis of the population according to their arrangement by castes.

	Population arranged in Castes.				
	Brahmins.	Rajpoots.	Shoodrahs, &c. Mahratta Cultivators.	Atee Shoodrahs or Low Castes.	Moossulmen.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Circar Dowlutabad....	5·455	2·395	67·513	12·435	10·298

We see from this analytical summary, that the bulk of the people is composed of Shoodrahs, nearly to the extent of three-fourths of the whole; and that upwards of two-thirds of this useful class, are to be found engaged in cultivating the soil. The Koonbees number 25,675, which in a population of 1,54,767, allowing five persons to a family, gives 1,667 per cent. of the people engaged in agriculture. It is to be understood that this calculation does not include the city of Aurungabad.

The Brahmans do not appear to be a large class, not numbering above one in twenty persons. The Rajpoots or Purdaisees are about one in fifty, and are principally the descendants of the troops entertained and settled in the country by Aurungzeebe. The low castes are met with in the proportions of something less than one in nine. Of these the Mhars or Dhers, are a very numerous body, forming two-thirds of the whole number. Bheels about one in twenty. These wild people are found principally in the western parts of the Circar, where they act as village guards. The Mangs, who are also employed at many places in the same capacity, are nearly of the same strength, being about one in seventeen.

The habits of the people are disposed to peacefulness, and they are sober, frugal, long suffering, and intelligent; the Koonbees for many centuries have followed the great business of life, the tillage of the soil, with infinite skill and industry. Amongst each other they are reported to be sincere and honest, but where the reverse occurs, it will generally be found to arise from their taking refuge in finesse, the only weapon the weak possesses against the strong, this system of dissimulation is more one of necessity than choice; that it exists there is little doubt of, but much is to be conceded in favor of people so circumstanced, as we find the poor ryots, whose extreme poverty has plunged them into irretrievable embarrassments, rendering them apathetic, and heedless for the future.

Education. Education, such as it is, may be stated as being exclusively confined to the Brahmans, shopkeepers, soucars, and upper classes of Mahomedans. Sixty schools, at which 813 pupils receive instruction, are in no way proportionate to the amount of population, the general illiterateness of which, may be best understood by the fact, that there are only found 3,627 persons able to read and write, or two and a half per cent. of the entire population,

exclusive of the city of Aurungabad. The amount of education embraces just such a sufficient knowledge of reading, writing, and arithmetic, as suffices for carrying on ordinary business in the bazars. The rudiments of which are first mastered by writing with a stile upon a board sprinkled with sand, or brick dust, and afterwards by writing with a fluid of pipe-clay and water, on a painted board. The language spoken throughout the Circar is Mahratta.

Police. In each purgunnah, the office of Cazi is hereditary, a custom, which causes many instances of the duties being exercised by inefficient persons.

The real police of the country are in fact the Jaglias, whose duty it is to trace robbers any where within their own precincts, beyond which, the responsibility falls upon the Jaglia of the next village. These persons are supported by huks and russooms, and are taken from the Mangs, Bheels, or even Dhers, as the case may be. The Purdaisee villages, that is, the Zemindars of which are Rajpoots, have no native Jaglias but depend on their own arrangements for police protection. Dacoity, and large gang robberies are put down by Seebundee troops under the Talookdar, assisted by the village Jaglias.

The passes through the ghats bordering Kandesh, are guarded by Chowkedars, acting under the orders of the officer commanding the hill rangers, and supported by detachments of regular troops from Aurungabad and Booldanah.

The whole system of police appears of a very unsatisfactory nature, being apparently guided more by arbitrary principles, than any thing recognized or fixed, whilst the ordinary practice of the Adauluths in criminal law, is very dilatory.

The Zillah Umeen is the head of the civil and criminal courts, both in the city and districts. In the latter the common cases are generally disposed of by the Aumil, who submits the matter to his superior farming the revenue, for summary decision, or a still further reference to the Zillah Umeen.

Punchayets are taken advantage of by Mussulmans as well as Hindoos, in special cases, where arbitrations are involved, the contending parties before the court sits binding themselves strictly to abide by the award.

Commerce.

There is very little trade carried on within the Circar, commercial transactions being all of little amount, and confined principally to a mere exchange of commodities for internal consumption. Its grand export is dry grain, which with sugar and culdee, form pretty well the entire amount of exported produce. Manufactures are confined to the wants of the community with the exception of a small quantity of brocade, silk goods, and a trifling amount of cotton cloths. The return trade is salt, iron, copper vessels, cotton cloths, and some other articles of less note for domestic use.

The grain trade is in the hands of a few native merchants, the principal of whom resides at Toka, employing agents at Aurungabad for supplying the consumption for large towns and the export trade to Bombay. In making their purchases, three methods are generally resorted to, the necessities of the poor Koonbees giving the advantage in every case, to the buyers. The first is called " Deodee" and is an agreement on the part of the cultivator, to return one pullah and a half of grain at harvest time, for every pullah given in the sowing season ; the second is called " Rungoda," when a price is fixed upon the grain in ear, and money advanced upon the probable produce it yields ; and thirdly, the collectors of grain advance the Government instalments when the grain is ripe to cut, at the rate of 25 per cent., stipulating for the loan being paid in ready cash, compelling the sale of the grain often at a loss, when the lenders usually become the purchasers, often times below the bazar price.

Excepting in large towns the population subsist on the produce of their own immediate neighbourhood ; their clothing is generally imported from Berar, cotton goods forming but a very trifling item of the manufacturing industry ; the plant not being cultivated in the Circar. Blankets of black wool, are made in every village by the Dhers, one man can make two a month, which he sells from 8 annas to one rupee each. In several places, a strong hempen canvass called tat puttee is made, the breadth of which is about half a foot.

The weaving of mixed goods fabricated from silk and cotton, called mushroo, is carried on languidly at Aurungabad, and Rouza ; and more briskly at Byzapoor ; the filature silk is imported from Bombay. Brocade is alone manufactured at Aurungabad, as well as gold thread.

Not being able to procure the amount of exports and imports, it is impossible to draw conclusions as to the state of trade between the Nizam's country, and the Company's, and I must therefore defer doing so until in possession of these documents.

The principal return trade of grain from Bombay is salt and iron. From inquiries in each Purgunnah, I have been able to calculate the amount annually consumed of salt as about 11,607 pullahs 1 md. 23 srs., which, with 300 pullahs to be allowed for the consumption of the city of Aurungabad, gives 14,607 pullahs as the gross amount. The consumption of this article upon an average amounted to three quarters of a seer a month, each individual; the price was 2 dubboo pice a seer.

Iron is received from Bombay and Bhewndy in sheets and rods, and from Nerinul in small bars; nearly the whole is employed for agricultural purposes, very little being used for building. Bullocks are never shod, neither are the tattoos of the villagers.

The annual consumption of iron as returned to me by the district officers, amount to 425 pullahs 1 md. 36 srs. from Bombay, and 178 pullahs 0 md. 34 srs. from Nerinul; which added to what is expended in the city, viz., 31 pullahs 0 md. 13 srs. makes in the aggregate 638 pullahs 1 md. 26 srs., therefore estimating the land under cultivation at 14,18,938 beegahs, there will be found to be expended about 15¼ pounds of iron upon every square mile of cultivation.

Sugar Manufactory.

Manufactures.

The first part of the process is undertaken by the farmer upon the field, who there expresses the juice, and boils it to a thick consistency called "Rab," sometimes carrying the evaporation further, reducing it to goor or Muscavado sugar, in which state it is disposed of to the Hulwai, or sugar refiners, who deprive it of its impurities, and render it fit for the market. The mills employed for crushing the cane are a great improvement upon those formerly in use, the shattered fragments of which are to this day seen around most of the villages throughout the Circar, supplying in their ruins, the silent evidences of a former flourishing condition of the manufacture of sugar. The old mill was a large block of stone hollowed out, and the juice of the sugar cane very rudely press-

ed out, by the means of a large wooden pestle, crushing the stalks against the sides. The common oil mill of the country is precisely of the same description; the mill that had superseded this rude machine, has two solid vertical cylinders, made from baubul wood, the heads of which are cut into the shape of endless screws, whose spiral grooves and ridges, four in number, interfold with each other on being put in motion, which is managed by a long horizontal lever fixed to one of the cylinders in its centre, and at either end of which, a pair of bullocks are attached, the height of these rollers is 5 feet, the head of the screw being one-third of the whole: the diameter is $2\frac{1}{2}$ feet, below the screw head, the surface is scored with narrow channels forming horizontal rings round each cylinder, which is done to assist in obtaining a firmer hold of the cane, and allowing the expressed juice the better to escape. As it trickles down these crushing rollers, it is received into a shallow gutter surrounding the mill bed, and passes from thence by an under ground channel, into a large receiver made of earthen-ware, sunk into the ground to be ready at hand for the operation of boiling. The apparatus for this purpose is so arranged as to allow the boiler to be on a level with the juice receiver, the fire-place being excavated so as to admit of this adjustment. The juice is now boiled rapidly, for four hours and a half, adding nothing to correct acidities and assisting it no further than in skimming off diligently the scum as it rises to the surface, when sufficiently inspissated, it is poured into a shallow circular hollow, formed in the floor of the mill, and stirred and raked about to cool and granulate; when sufficiently cooled it is poured into holes made in the ground, round the sides of which a coarse cloth has been passed, so that when perfectly hardened, the cloth is pulled up, and the goor detached. These weigh each on an average, about thirty-five seers, and are found more convenient for carriage, than when the inspissation has not been carried farther than leaving it in the state of fresh honey, as is the case when it is sold as rab; in this state it is poured into large earthen jars holding four maunds, four of which are a load for one gharree. Though rab is more liable to damage by keeping than goor, and less convenient to transport, yet the Hulwai prefers it, on account of the difficulty there would be in its adulteration, whilst goor admits of its qualities being lowered by mixture with impurities.

In making sugar, the first thing the Hulwai does, is to fill with rab a large closely wattled bamboo basket, five feet high, and twenty feet in circumference, capable of holding about forty pullahs of rab, the basket stands upon horizontal poles, having a well beneath, sunk in the floor, into which drips the draining from the baskets, which is called " kaki," or molasses. It is allowed thus to remain for fifteen days, when from the consistence of honey it will have been found to have taken the appearance of Muscavado sugar, the plan for freeing it of its gluten, and other impurities, is accomplished by a series of " meltings," as it is termed in the West Indies: that is, breaking up the crystallized mass, and forming the whole into a pap, with a mixture, as thus prepared, five seers of salt, two seers of soda, one seer and a half of the cuttings of the euphorbia tiraculli ; one seer of cuttings of the euphorbia ligularia, and one seer of the ashes of the plantain tree, the whole to be boiled for one day in two maunds of water, strained and mingled with the raw sugar into a pappy state, after which it is allowed to drain for ten days, when the same process of melting is again performed, with this difference, that this time the several ingredients are diminished, there being but one seer of salt, one seer of soda, one seer and a half euphorbia tiraculli, one seer of euphorbia ligularia cuttings, and one seer of plantain ashes with only twenty seers of water. Five days are now sufficient to drain the crystallized mass, after which the surface is covered to the depth of four fingers, with plants of the vallisneria verticellata, removing them every third day until the process is finished. About twenty seers of sugar are usually found encrusted on the surface at each removal ; the time required from the first steps of refining to bringing into this condition occupies about ninety days, and fits it for the remaining operation, which is to clarify the sugar, and is thus performed : one maund of the prepared sugar is dissolved into a thick syrup, by first adding three seers of water, and boiling gradually, adding to this, fourteen more seers of water, with two seers of milk ; the impurities being carefully removed as they arise upon the surface. The clarified syrup is then gently evaporated to the point of crystallization and left to evaporate, and crystallized in the sun and air, which, when effected, the crystals are crushed fine, and in this state it is sent to the market. This sugar is very sweet, and of a very fair white color.

Forty pullahs of rab when thus converted into sugar, and refined,

gave on an average forty maunds of sugar, sixty maunds of kaki or molasses, and twenty maunds of waste, the expenses attending which would be as follows:

	RS.	A.	P.
Forty pullahs of rab, - - - - -	680	0	0
Carriage to refining house, - - -	5	0	0
Expense of bamboo basket, - - -	1	0	0
Wages to labourers, - - - - -	46	0	0
Wages to sugar refiner, - - - -	12	0	0
Tank weed (by the job), - - - -	4	0	0
Ingredients for melting, - - - -	1	10	0
Firewood, - - - - - -	10	0	0
Milk, - - - - - - - -	4	0	0
Hire of iron cauldron, - - - - -	20	0	0
Mats, - - - - - - -	0	4	0
House rent, - - - - - - -	2	0	0
Hyd. Rupees	785	14	0

Forty maunds of sugar sells for rupees 720, at 18 rupees a maund, and sixty maunds of kaki or molasses for rupees 180, at 3 rupees a maund, making altogether rupees 900 for the batch, out of which, when the expenses of its manufacture have been deducted, there will remain a balance of rupees 114-2 as the profits of the manufacturer.

Paper Manufactory.

The process of paper making is followed on rather a large scale at the village of Kaguspoor, midway between Rouzah and Dowlutabad. The whole of the village employs itself in this business; the inhabitants of which, with a few exceptions, are all composed of Mahomedans. The cold season is the one most favorable to their purpose, as not only is water then more plentiful, but there are not blowing those high winds so prevalent in the hot months, and which interfere very seriously with the process. The manufacture has of late years greatly declined, and still continues to be depressed, no reasons for which were assigned.

The materials out of which the paper is manufactured, are old remnants of tat puttee, and gunnee bags, which being cut into pieces about an inch square are subjected to a pounding under the "daik-

lee" for a whole night. In the morning the beaten shreds are carried to the tank, and all dust and dirt removed by washing, which is thus managed: a long cloth has its two ends made fast round the loins of two men, who enter the tank, and commence stirring the shreds well about in the cloth between them, by which means it obtains a very effectual cleansing, after which it is returned to the "daiklee," and adding lime, in the proportion of one maund to three maunds of shreds, is again well pounded by the "daiklee" for eight days, and then left quiet for a week, when after repeating this alternate operation of pounding and resting, it is submitted to a thorough washing to detach every particle of lime from the mass, which when effected, soda and soap in equal proportions are added; four maunds of each to every three maunds of pulp, when another pounding is given, and the mass left in heaps for a day. On the following one, it is well washed, and laid out to dry and bleach for four days. When the moisture has by this time all escaped, the dried substance is rubbed by the hand upon a chunamed floor, sifting it afterwards to allow the dust to pass away, when three maunds of soap to the same proportions of pulp are used, and again beaten for eleven days, again washed, and again dried and bleached, when it is further reduced to a pultaceous consistence with water for use, by beating and treading in a circular hole, made of chunam for this purpose, from thence the pulp is removed into a cistern for use. This cistern is four feet by five wide with sides sloping towards the base, and is three feet deep.

The moulds consist of a frame-work adapted to the size of the sheets required, with narrow rims, having bars placed lengthways, their edges presenting, and an inch a part; upon the frame is laid a fine chick made of a peculiar grass, and kept firmly fixed by securing the edges with two flat sticks, that fit in at the top and bottom of the frame; the moulds being prepared, the workman who sits squatted close to the edge of the cistern, stirs up the pulpy matter with a stick and then dips the frame vertically in the cistern, gradually inclining the lower part upwards, so that by the time it reaches the surface, it lies flat upon the water; he then carefully and quickly notices those portions in which the pulpy matter lies uneven, and remedies by again dipping the frame into the cistern, making all smooth and even by a series of almost imperceptible jerks and shakings of his wrists; after a short time the chick is raised, and the newly formed

sheet turned over on a heap, beside the workman; from whence they are taken away in their wet state, and fixed against the walls of the house, both on the inside and out, for which purpose the walls are kept very clean and smooth, an appearance which cannot but strike strangers as they pass through the village, after having been accustomed to the neglected state of native houses generally prevalent in the Mahratta country. When dried they are taken down, and rubbed over by the hand with thin paste, and again dried, after which it undergoes a glazing process by means of a smooth polished stone, being rubbed over the dried sheets upon the board, the form of which is slightly concave.

The better sorts of paper require a longer manipulation, than the inferior kinds, the finest kinds of all take six months preparing.

Remnants of tat-puttee cost 9 rs. to 12 rs. per pullah; old ropes, that are used for the commonest description (shurbuttee) cost 3 rs. per pullah. The soap is procured from Berar, and is bought at rupees 30 per pullah; the soda is procured from the Loonar lake and costs 5 rs. 12 as. 9 p. per pullah.

The quantity of soda, lime, and soap used, varies with the description of paper made. For the manufacture of a ream, for instance, of the finer sorts, two seers and a half both of soda and lime, are required, and seven and a half seers of soap; whilst for the common kinds but one seer of soda and of lime, and but three seers of soap are necessary. Eight seers of tat-puttee is the quantity required for making a ream of paper.

The expense of labor employed upon the better kinds of paper, as the Bahadoor Khana, is as follows for one ream:

	RS.	A.	P.
Eight seers tat-puttee,	0	8	6
Pounding the tat-puttee,	1	3	0
Soap,	1	13	0
Soda and lime,	0	2	0
Washing,	0	12	0
Making into paper,	0	4	6
Drying and cutting,	0	3	0
Glazing and pasting,	0	9	0
Rupees...	5	7	0

The cost of preparing three pullahs of tat-puttee would be as follows:

	RS.	A.	P.
Lime, - - - - - - - - - -	1	0	0
Soda, - - - - - - - - - -	3	0	0
Soap, - - - - - - - - - -	90	0	0
Wages, - - - - - - - - -	72	0	0
Total...	166	0	0

There are six sizes and varieties of paper here made, which with their dimensions and prices are here given:

	Breadth. Feet.	Breadth. Inch.	Length. Feet.	Length. Inch.	Rs.	A.	P.
1. Nizammool khanna, - - -	2	6	3	0	36	0	0
2. Bahadoor khanna, - -	2	2	2	6	9	4	6
3. Shaishta khanna, - - -	1	7	2	0	4	12	6
4. Moradar, - - - - -	1	2	1	6	1	14	0
5. Nizamshae, - - - -	1	2	1	4	1	8	0
6. Shurbuttee, - - - -	2	0	1	6	0	12	0

Manufacture of Salt Petre.

The manufacture of Salt Petre is principally confined to a few villages lying between Gandapoor and Byzapoor. Between these towns, a tract of land exists, much mixed up with calcareous earths, by the admixture of which, with animal matter, the spontaneous generation of nitre is greatly facilitated. The source whence this salt is obtained, is the white earth, or pandre muttee, to be seen no where but in the vicinity of habitations, and would seem to have obtained its compact texture and white color from some unexplained action of the atmosphere, upon a soil, strongly imbued with animal matter. The nitrogen present in such earths, uniting with the oxygen of the air, forms nitric acid, and is immediately fixed by the potash, found existing in many basaltic soils, forming by its union, nitrate of potash, or saltpetre.

There are two processes adopted for procuring saltpetre, the one by evaporating the solution containing the salt in large iron vessels, and the other by boiling the liquor to a certain density, and then evaporating the liquor in large shallow pans, or chunam beds.

The first operation is only followed during the cold months of the year, the white earth containing the salt is collected from scraping old walls and roads about the village, and a certain quantity thrown into a shallow cistern about four feet in diameter and two feet deep; water

is then poured in till it covers the earth, and is then well stirred together. After a day's digestion, the water is allowed to drain away laden with saline matter: by opening a hole made for the purpose, at the bottom. The lixivium thus obtained, is then boiled rapidly in an iron pot for twelve hours, removing the scum as it rises, and then poured into small earthen pots to cool and crystallize, which are placed edge-ways to drain: it receives no further preparation; and in this state is of a reddish brown color.

One boiling of the iron pot in use, will produce twelve seers, and the price it sells for is 10 rupees a pullah.

People necessary for the operation are three men for scraping and bringing the white earth, at two rupees a month. Three men for chopping wood and bringing water, and two men for attending the furnace, and boiling, each at three rupees a month.

Wood being scarce in the part of the country where the manufacture is carried on, the operation is made dearer than it otherwise would be, each boiling consuming half a rupee's worth of fuel. The work goes on by night as well as during the day.

The other mode is adopted during the hot season and requires a high mound of earth, at the foot of which are placed the shallow chunamed pans for evaporation; on the summit of this mound, the white earth is lixiviated, and after being boiled in an iron pot, is poured into channels that convey it down the sides of the mound into the pans below, depositing its earthy particles as it passes along, and when evaporated, the crystals deposited are swept away and packed for sale.

Pottery.

A coarse manufacture of porous unglazed earthen pots called mutkas is carried on in every large sized village, the process of which is as follows. A particular sort of black clay is procured from the nullahs, and tempered by admixture with horse dung and ashes, and well trodden for a whole day under foot; the method of forming the tempered clay into vessels is done by placing a lump of it upon the centre portion of a horizontal wheel, applying rotatory motion before doing so, the velocity of which is greatly increased by whirling it round briskly two or three times by means of a stick fixed in holes made for the purpose on its outer rim.

The wheel is a very simple affair, having a disc placed in the centre,

sixteen inches in diameter, on which the clay is thrown for working into shape, and from the sides of which eight spokes proceed to the outer rim, whilst below there is a hole which receives the spindle it turns on ; this spindle being the point of a bullock's horn, let into a round stone. The entire diameter of the wheel is three feet, and its breadth three inches. The frame work is made of baubul wood, the bulk of the outer rim being composed of clay, goat's hair, and horse dung, altogether not weighing above forty seers.

The potter accurately guessing the quantity of clay required for his purpose detaches it from the mass, and casts it on the centre of the wheel, now in rapid motion ; when dipping his hands in water, he works the lump up into a pyramidal form, and then down into a flat shape, repeating this until he has deprived the mass of any air bubbles it may contain. In this operation, the fingers are placed inside with the thumbs outside the lump of clay, a piece of wet rag smooths the lips of the vessel and a thin string drawn between the mould and the disc, separates it from the wheel. The vessel thus shaped, is now removed to a shady place to permit its drying to a particular point, when it is further prepared by being beaten into its proper form, by a flat wooden mallet, it possessing in this stage peculiar tenacity, admits of this hammering into shape, which is effected by placing a convex stone on its inner side, on which the hammering acts. Whilst this process is going on, the potter is continually sprinkling the beaten parts with fine rice-straw ashes, when sufficiently beaten into form it is again put by for two days under shelter, and covered with damp sand, after which it is subjected to a further hammering, and then burnishing the surface, the potter places it as before in a shady covered place to dry, and in a fortnight it is fit for burning. These pots bake black, are very brittle, breaking on the least violent usage, but their small price renders this of less consequence, a large sized mutka costing but one pice ; their porous nature keeps water contained in them very cool.

Silk Manufacture.

There is a considerable trade carried on at Byzapoor in the manufacture of silk and mixed goods called mushroo ; employing one hundred and twenty-five looms in the process, and ten houses for silk throwing. Besides these looms, there are fifty also for making cotton cloths.

The raw silk is imported from Bombay at twelve rupees a seer, and when prepared at seventeen rupees a seer, the declared value of the manufacture exported last year was rupees 37,500, the price of 6,250 pieces.

The places the silk goods are exported to are principally to the great fair at Mhajee in Kandesh, Nassuck, Nuggur, Yeola, and Parola.

The daily wages of the work people are four annas a man, two annas a woman, and one anna a boy: the number of operatives employed are 112 Hindoos, and 13 Mussulmen.

The number of hands required for each silk throwing machine, is five. The cotton weavers are all Hindoos and receive four rupees a month wages.

Weights and Measures.

The subject of weights and measures having been considered, when reporting upon the city of Aurungabad, leaves nothing to be added to what has already been given, further than stating that some discrepancies in the value of the beegha were occasionally found occurring throughout the Circar; for example, at Aurungabad, the beegha is a square of 40 rods, the length of each rod being 43 inches, forming a superficial measure of 2,958,400 square inches English = 2,282 928* square yards, or very little less than half a British acre. Elsewhere it is a square of 20 rods, or pands, each rod measuring 85 inches, that is a superficial measure of 2,890,000 square inches English, 2,229·1,216 square English yards. There is a smaller rod in use for measuring baghaet lands which is shorter than the above, by 8 inches in every pand.

Lending and Borrowing.

The regular established rate of interest is 8 annas per cent. per mensem, amongst the Soucars themselves, who increase this up to 2 rupees per cent. in times of emergency. To traders, usually from 10 annas to 1 rupee per cent. per mensem is allowed, according to their degrees of credit and responsibility; whilst from persons not engaged in trade, from 12 annas to 2 rupees is demanded.

(Signed) W. H. Bradley, Surgeon,
8th Regt. Nizam's Infy. on Special Duty.

Boldanah,
September 8th, 1848.

* Erroneously stated in a former report at 2,210 square yards.

Return of the Revenue in the Dowlutabad

	Land Revenue.			Mohturpha or House and Shop Tax.			Sayer.			Arrack.			Toddy.			Grazing Cattle.			Rumnas.		
Hursool, - -	19,736	3	6	129	0	0	0	0	0	297	6	0	175	0	0	0	0	0	534	11	0
Havalee Aurungabad, - - -	7,692	12	9	65	4	0	0	0	0	377	0	0	330	11	0	0	0	0	0	0	0
Sittarah, - -	4,320	11	9	0	0	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0
Wallooj and Toorkabad, - -	52,076	11	0	725	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saitoonda, -	22,537	11	9	731	15	0	385	3	9	249	11	6	7	0	0	0	0	0	0	0	0
Kooltabad, - -	13,867	11	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dowlutabad, -	8,115	2	0	15	0	0	1,621	0	0	15	12	0	25	0	0	79	0	0	62	0	0
Elloora, - -	17,271	9	3	363	4	0	226	9	6	109	0	0	0	0	0	0	0	0	17	4	0
Sooltanpoor, -	17,772	5	6	143	4	0	238	8	0	25	11	0	0	0	0	0	0	0	51	9	6
Taklee, - -	11,369	1	3	138	8	0	41	0	0	27	0	0	0	0	0	18	14	0	0	0	0
Phoolmurree, -	70,318	12	6	469	10	0	516	6	0	30	0	0	2	0	0	0	0	0	15	0	0
Kunhur, - -	18,878	14	3	163	3	0	3,773	9	6	1,137	4	0	12	0	3	169	4	0	0	0	0
Gowtala, - -	416	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Untoor, - -	53,631	2	6	462	4	9	876	13	6	238	8	0	5	0	0	450	0	0	0	0	0
Khanapoor, -	8,052	15	9	154	8	3	327	11	0	34	2	6	0	0	0	19	0	0	0	0	0
Khundala, - -	12,571	6	3	124	8	0	598	0	0	0	0	0	0	0	0	23	6	0	0	0	0
Gandapoor, -	78,169	8	0	845	11	6	2,628	8	3	48	0	0	0	0	0	16	0	0	0	0	0
Byzapoor, - -	39,439	10	0	1,320	9	9	1467	0	0	30	0	0	12	0	0	0	0	0	0	0	0
Total..	4,56,238	6	6	5,872	11	0	12,700	5	6	2,674	7	0	568	11	3	775	8	0	680	8	6

rcar *for the year* 1845-46.

Fines.			Mango Groves.			Salamee or Presents.			Sundries.			Gross Amount.			Gaon Khurch.			Amount of Revenue appropriated after deducting the Village expense.			Amount of Revenue alienated.		
0	0	0	187	3	6	23	0	0	4	0	0	21,086	8	0	3,610	3	6	10,177	13	3	7,298	7	3
0	0	0	243	1	0	0	0	0	327	2	0	9,035	14	9	1,396	15	3	5,098	0	6	2,540	15	0
0	0	0	194	12	0	53	3	9	0	0	0	4,628	11	6	1,252	15	0	1,716	3	9	1,659	8	9
0	0	0	0	0	0	0	0	0	0	0	0	52,801	11	9	7,164	1	6	42,480	6	0	3,157	4	3
135	3	6	129	8	0	29	6	0	202	6	0	24,407	12	0	4,902	6	9	19,505	5	3	5,425	4	0
0	0	0	196	0	0	0	0	0	0	0	0	14,084	11	0	2,754	15	3	5,904	7	9	2,438	3	0
150	0	0	180	0	0	0	0	0	280	1	6	10,542	15	6	1,065	9	0	7,039	3	6	3,181	2	3
20	0	0	160	0	0	41	12	3	224	13	3	18,432	4	3	3,251	12	0	12,001	6	0	6,782	5	3
203	0	0	139	3	0	0	0	0	63	0	0	18,636	9	0	2,103	14	9	9,750	5	0	9,497	2	0
0	0	0	52	0	0	0	0	0	0	0	0	11,646	7	3	2,149	5	3	0	0	0	15,791	1	3
259	10	0	308	3	0	0	0	0	0	0	0	71,919	9	6	10,236	10	6	45,891	13	9	3,502	13	6
70	4	0	231	0	0	0	0	0	170	1	3	24,605	8	3	4,148	1	6	16,954	9	3	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	416	1	6	75	13	9	340	3	9	0	0	0
35	4	0	788	0	0	0	0	0	0	0	0	56,487	0	9	9,885	4	0	40,691	7	0	5,910	5	9
0	0	0	4	6	0	0	0	0	0	0	0	8,592	11	6	1,096	0	0	6,305	3	0	1,191	8	6
0	0	0	0	0	0	21	0	0	0	0	0	13,338	4	3	1,988	10	0	11,349	10	3	0	0	0
83	8	0	13	0	0	21	0	0	0	0	0	81,825	3	9	12,607	8	9	66,040	13	6	3,176	13	6
95	2	0	0	0	0	156	0	0	0	0	0	42,520	5	9	11,421	14	0	28,718	6	3	2,380	1	6
1,051	15	6	2,826	4	6	350	6	0	1,271	2	6	4,85,010	6	3	81,112	0	9	3,29,965	5	9	73,932	15	9

Return of the Live and Dead Stock in the Circar of Dowlutabad, Soobah Aurungabad.

Stock.	Bullocks.	Cows.	Calves.	He Buffaloes.	She Buffaloes.	Calves.	Sheep.	Goats.	Horses.	Tattoos.	Colts.	Asses.	Fowls.	Ploughs.	Bukkeer.	Carts.	Mhotes.	Sugar Mills.	Oil Mills.	Sugar Boilers.
Number.	51,000	40,207	13,377	1,068	11,795	2,354	36,168	30,793	84	4,448	444	2,362	1,384	10,306	21,360	2,810	5,116	196	418	220

Return of principal Vegetable produce, its value, and quantity of land cultivated in the Circar of Dowlutabad, Soobah Aurungabad.

Produce.	Quantity of Land.		Quantity of Produce.			Value of Produce.		
	Beeghas.	Pands.	Pullas.	M.	S.	Rs.	A.	P.
Sugar Cane, - - -	2357	2½	2609	0	0	38555	3	5
Wheat, - - - - -	89094	15	32008	0	30	226230	0	0
Bajree, - - - -	197923	18	59772	2	20	287996	0	0
Jowaree, - - -	142069	18½	40997	0	0	189272	0	0
Opium, - - - - -	936	12¼	11	2	1¾	8621	0	0
Ooreed, - - - - -	2033	12	892	1	10	3563	0	0
Gram, - - - -	40139	15	13798	1	3	94130	0	0
Tour, - - - - -	19113	13	5009	1	10	23672	0	0
Tillee, - - - -	5503	7½	1291	0	10	6385	0	0
Kuldee, - - -	18648	14½	6602	0	24	22294	0	0
Rice, uncleaned, - -	4149	9	2160	1	5	10044	0	0
Peas, country, - -	394	13	159	2	20	633	0	0
Tobacco, - - - - -	2122	19	564	1	30	6236	0	0
Moong, - - - - -	3218	16	1056	0	20	3764	0	0
Hemp, - - - - -	3457	0	1045	2	20	7045	0	0
Karleh, - - - - -	816	10	166	1	20	501	0	0
Mukkai, - - - -	150	10	51	0	0	76	0	0
Fruits, - - - - -	324	1	269	0	0	2502	0	0
Vegetables, - - -	481	0	0	0	0	1707	0	0
Cotton, uncleaned, - -	527	13	213	0	20	1284	0	0
Turmeric, - - -	49	12	30	2	0	413	0	0
Koolthee, - - - -	822	16¼	38	0	0	48	4	0
Chillies, - - - - -	50	0	15	0	0	120	0	0
Indigo, - - - - -	13	5	1	0	39	98	12	0
Dill Seed, - - - - -	220	0	40	0	0	140	0	0
Ralla, - - - - -	3	0	3	0	0	6	0	0
Linseed, - - - - -	100	0	20	0	0	60	0	0
Betel Leaves, - - -	35	0	0	0	0	254	0	0
Ground Nut, - - - -	50	0	38	1	20	133	8	0
Total...	534807	12½	0	0	0	935791	15	6

Return of the Population of the Circar of Dowlutabad, Soobah Arungabad.

Hindoos.	Amount.	Mahomedans.	Amount.
Brahmin, - - - - - -	3,065	Shaik, - - - - - -	3,831
Purdaisee, - - - - -	1,439	Syed, - - - - - -	552
Bunniah, - - - - - -	1,778	Moghul, - - - - - -	112
Byragee and Gosai, - -	580	Pathan, - - - - -	1,023
Bhat, - - - - - -	75		
Kanarra, - - - - -	88		
Hulwai, - - - - - -	79		
Coonbee, - - - - -	25,675		
Mallee, - - - - - -	142		
Bhatia, - - - - - -	130		
Goorow, - - - - - -	65		
Durzee, - - - - - -	449		
Jungum, - - - - - -	13		
Kussar, - - - - - -	183		
Sonar, - - - - - -	674		
Lohar, - - - - -	300		
Burrhue, - - - - - -	487		
Koomhar, - - - - -	447		
Dhungur, - - - - -	1,344		
Rungriz, - - - - -	92		
Kostee, - - - - - -	407		
Sallee, - - - - - -	138		
Kullal, - - - - - -	84		
Thumbolee, - - - - -	27		
Bunjara, - - - - - -	45		
Kolee, - - - - - -	238		
Josee, - - - - - -	6		
Hujjam, - - - - -	526		
Bhoee, - - - - - -	102		
Mullaure, - - - - -	19		
Manbhow, - - - - -	21		
Turmullee, - - - - -	4		
Baildar, - - - - - -	7		
Tailee, - - - - - -	836		
Dhobee, - - - - - -	322		
Lohnarra, - - - - -	2		
Wattara, - - - - - -	4		
Tuckarra, - - - - -	20		
Jeengur, - - - - - -	17		
Burrood, - - - - -	34		
Kussai, - - - - - -	23		
Putwai, - - - - -	4		
Bhamta, - - - - - -	4		
Kykaree, - - - - -	7		
Bheel, - - - - - -	389		
Dohur, - - - - - -	42		
Chumar, - - - - - -	876		
Dhair or Mhar, - - -	4,445		
Mang, - - - - - -	936		
Total..	46,690		

Return of average prices of Grain from 1842 *to* 1848 *inclusive in the Circar of Dowlutabad, Soobah Aurungabad.*

Grain.	1842.			1843.			1844.			1845.			1846.			1847.			1848.			
Goor,............	10	13	3	10	10	9	12	5	1	13	13	10	15	2	0	14	0	0	13	0	0	Per pulla
Wheat,...........	2	9	8	2	15	3	3	4	8	4	12	4	7	0	5	4	8	0	2	12	0	
Bajree,...........	2	1	3	2	3	9	2	8	9	3	8	5	4	9	10	3	0	0	2	4	0	
Jowaree,..........	1	7	5	2	0	7	2	3	11	3	4	10	4	3	7	3	0	0	2	2	0	
Opium,............	4	9	8	4	12	0	5	4	0	5	6	2	6	2	6	5	0	0	4	12	0	Per seer.
Ooreed,...........	2	5	11	2	9	8	2	14	0	3	2	4	4	2	3	3	0	0	3	0	0	Per pulla
Gram,............	2	8	5	2	13	0	3	3	4	4	4	4	6	11	7	5	0	0	3	0	0	
Tour,.......... ..	2	3	8	2	7	4	2	13	6	3	12	2	5	1	7	4	0	0	2	0	0	
Tillee,............	3	3	5	3	7	9	3	11	7	4	6	6	5	12	2	5	0	0	4	8	0	
Kuldee,..........	1	12	5	1	15	10	2	5	4	2	12	5	3	5	8	3	8	0	3	0	0	
Rice, uncleaned,..	3	5	0	3	4	0	3	8	10	4	1	7	4	10	9	4	0	0	3	12	0	
Peas, country,.....	2	3	10	2	4	8	2	7	7	2	13	8	4	3	8	3	0	0	2	8	0	
Tobacco,.........	6	5	9	7	0	0	7	12	7	8	11	10	9	2	10	8	0	0	8	0	0	
Moong,...........	2	7	10	2	11	10	3	1	5	3	10	0	4	7	3	3	0	0	3	0	0	
Hemp,............	4	6	1	4	8	3	4	13	0	5	7	8	6	3	9	4	0	0	3	8	0	
Karleh,...........	1	11	2	1	14	9	1	15	0	2	2	9	3	0	8	2	0	0	2	0	0	
Mukkai,..........	1	2	0	1	2	7	1	2	7	1	2	7	1	8	0	1	0	0	1	2	0	
Fruits, &c.........	3	8	0	3	10	8	4	2	8	4	4	0	4	0	0	3	0	0	3	0	0	
Vegetables,.......	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No fixed
Cotton, uncleaned,	9	4	8	10	13	1	12	4	8	11	8	0	8	10	8	7	0	0	6	0	0	rate.
Turmeric,........	8	5	4	9	5	4	10	0	0	13	10	8	14	8	0	12	0	0	11	8	0	
Koolthee,.........	1	8	0	1	8	0	1	2	6	1	6	0	1	8	0	1	6	0	1	4	0	
Chillies,...........	7	8	0	8	0	0	6	12	0	6	8	0	8	0	0	10	0	0	9	0	0	
Indigo,............	2	8	0	2	0	0	2	0	0	1	8	0	1	4	0	2	0	0	1	12	0	Per seer.
Dill Seed........	2	12	0	3	0	0	3	4	0	3	8	0	3	8	0	3	0	0	2	12	0	Per pulla
Ralla,.............	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	2	0	0	
Linseed,...........	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	3	0	0	[rate.
Betel Leaves,.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No fixed
Ground Nut,......	3	0	5	3	0	5	3	0	11	3	8	0	5	0	0	4	0	0	3	8	0	Per pulla

Return of the annual consumption of Iron and Salt in the Circar.

Designation.	Average value by weight.	From whence brought.	Quantity.			Value.			Remarks.
Iron.			Pullas.	M.	S.	Rups.	A.	P.	
Europe, 1st quality,...	3 seers } per Rupee	Bombay and Nirmul.	44	1	17	1762	13	8	
Europe, 2d quality,...	7 do. } per Rupee	Bombay and Nirmul.	381	0	$19\frac{3}{4}$	6666	13	10	
Native,......	4 do. } per Rupee	Bombay and Nirmul.	178	0	$34\frac{1}{2}$	5309	10	0	
Total...	....	....	603	2	$31\frac{1}{4}$	13739	5	6	
Salt,......	8 Rupees per Pullah.	Bombay and Bhewndy	11607	1	23	92860	3	2	Computed at $\frac{3}{4}$ seers per head.

Return of the state of Education in the Circar.

Schools.			
Persian.	Mahratta.	Number of Pupils.	Persons able to Read and Write.
5	56	813	3,627

Return of the principal Diseases and Deaths in the Circar of Dowlutabad, Soobah Aurungabad.

Leprosy of Joints.	Leprosy of Skin.	Elephantiasis.	Guinea Worm.	Stone in the Bladder.	Blind.	Idiot.	Mad.	Lame.	Deaf.	Small Pox.	Cholera.	Fever.	Other Diseases.	Total.
115	69	53	96	7	415	5	32	30	23	1028	2547	591	1805	5971

Return of Seebundees and Sepahis employed in the Circar.

	Suwars.	Foot.
Sebundees and Sepahis.	46	872

Meteorological Table for 1847, *taken at Aurungabad.*

	Sun-rise.	9 A. M.	3 P. M.	6 P. M.	9 P. M.	Winds.	Rain.	Diurnal Range.
	°	°	°	°	°			°
January, - -	57	69	79	75	70	E.S.E.	0·600	22
February, - -	46	67	86	72	62	N.E.	0·000	40
March, - -	68	80	89	82	80	N.E.	0·000	21
April, - -	78	87	97	87	86	N.E.N.	0·120	19
May, - - -	83	91	91	95	90	N.E.N.	5·690	16
June, - -	77	80	85	87	79	S.W.N.W.	7·850	10
July, - - -	75	78	85	83	77	N.W.	6·780	10
August, - -	73	76	83	80	75	N.W.	2·390	10
September, - -	72	75	79	75	72	N.W.	18·310	7
October, - -	69	79	85	80	79	NNE.NW	1·000	16
November, - -	62	70	77	76	70	N.E. S.E.	1·860	15
December, -	55	74	78	77	73	S.E. N.E.	0·000	23
Mean, - - -	67	77	85	80	76		44·000	

Mean annual Temperature 77°.

W. H. BRADLEY, Surgeon,
8th Regiment Nizam's Infantry,
on Special Duty.

BOLDANAH,
8th September, 1848.

THE IRISH EMIGRANT.

1

I'm sitting by the stile Mary,
Where we sat side by side,
On a bright May morning long ago,
Where first you were my bride.
The corn was springing fresh and green,
And the lark sang loud and high;
And the red was on your lip Mary,
And the love-light in your eye.

2

The place is little changed Mary,
The day is bright as then;
The Lark's loud song is in the air,
And the corn is green again;
But I miss the soft clasp of your hand,
And your breath warm on my cheek;
And I still keep listening for the words,
You never more may speak.

3

'Tis but a step down yonder lane,
And the little church stands near;
The church where we were wed Mary,
I see the spire from here.
But the grave-yard lies between Mary,
And my step might break your rest;
For I've laid you, darling, down to sleep,
With your baby on your breast.

4

I'm bidding you a long farewell,
My Mary kind and true;
But I'll not forget you, darling,
In the land I'm going to;
They say there's bread and work for all,
And the sun shines always there;
But I'll not forget old Ireland
Were it fifty times as fair.

5

And often in those grand old woods,
I'll sit and shut my eyes;
And my heart will travel back again
To the spot where Mary lies;
And I'll think I see the little stile,
Where we sat side by side;
And the springing corn, and the bright May morn,
Where first you were my bride.

LADY DUFFERIN.

IDEM LATINE REDDITUM.

1

Sede moror, Marie, quâ nos consedimus olim,
Gaudentes dulci proximitate frui.
Ver erat; et Maii ridebat mensis amœni
Mane novum, atque aderas tu nova nupta mihi.
Surgebant in agris segetes, atque arva virebant;
Aere fundebat dulcis alauda melos.
Et Marie's roseo fulgebant labra colore,
Conscius inque oculis irradiabat amor.

2

Non facies mutata loci, vernœque diei
Clarus adhuc idem splendor adornat agros.
Aere et argutas deducit alauda querelas,
Et viridis passim contegit arva seges.
Sed mihi non dextram teneræ conjungere dextræ,
Nec licet amplexus rursus inire tuos.
Incassum videor blandas audire loquelas,
Verbaque non iterum voce cienda tuâ.

3

Haud procul hinc angusta viam quâ semita ducit,
Exigui fani limina sacra patent.
Connubii ritus nostri celebratus in illis
Œdibus; hinc spirœ est aspiciendus apex.
Ast jacet interea spatium lugubre sepulcri,
Nec requiam gressu fas violare tuam.
Namque ibi te posui longo requiescere somno,
Maternoque jacet nata tenella sinu.

4

Longum dico vale, Marie, fidissima conjux,
Longinquas oras expetiturus eo.
Sed tellure novâ, mea quo vestigia tendo,
Non cadet ex animo dulcis imago tui.
Illic larga Ceres, et præmia justa labori,
Nec latet obscurâ condita nube dies.
Littora sed patriæ non obliviscar Iernæ,
Sint aliena magis conspicienda licet.

5

Atque pererrantem sylvas me sæpe juvabit
Fessum gramineo ponere membra toro;
Et clausis oculis, videar repetisse sepulcrum,
Quâ, Marie, cineres contegit urna tuos,
Et sedem spectare, ubi nos consedimus olim,
Gaudentes dulci proximitate frui,
Et virides segetes, et Maii mensis amœni
Mane novum, quum aderas tu nova nupta mihi.

A. J. A.

VI. *Remarks on the Abstract Tables showing the number of Native Soldiers discharged from the Madras Army, during the five years from* 1842-3 *to* 1846-7 *inclusive. By Assistant Surgeon* Edward Balfour, *of the Right Honorable the Governor's Body Guard.*

In the five years from September, 1842, to August, 1847, inclusive; 2,149 of the Madras Native Army were discharged the service. A cursory examination of the causes which led to their discharge shows that crime, disease, and natural physical unfitness were the chief agencies in operation: we cannot, however, ascertain the exact share that each of these causes had, for, of the 2,419 individuals who have been in this manner removed from the strength of the Army, of 1,077, or nearly the half of them, no mention was made, in the monthly discharge rolls, of the crime or cause which had led to their dismissal. Had this omission not occurred the records would have furnished a sufficient number of facts to admit of many more practical deductions than they now allow; but, even as they are, they supply information of a nature calculated to assist us in the selection of recruits, the repression of crime, and the internal economy of the Army.

Although dismissal or discharge from the service is more frequently had recourse to in the Native Army of India than amongst H. M. soldiers, the military code admits of several other punishments. The Articles of War in force, when these rolls of discharged men were for the first time published, were promulgated in the year 1827, and contained 82 articles, 43 of which specified crimes punishable by Military Courts, and the punishments which the latter could award. These punishments were death; corporal punishment; stoppage of pay and allowances; fines; dismissal; reduction; and forfeiture of pension. This code continued in force until 1845, but it was greatly altered by the Governor General's order of the 24th February, 1835, by which corporal punishment in the Native armies was prohibited, and discharge from the service substituted for it; and it was still further altered by the penal act of 1839, sanctioning, along with their discharge from the service, imprisonment, with or without hard labor.

In this code, of 1827, there were 15 articles specifying crimes for which Military Courts could award sentence of death, but, as the

chief punishment before 1835 was flogging, so discharge from the service and imprisonment with hard labor, was the usual sentence after 1839.

On these articles being annulled by Act XX. 7th October, 1845, the code, then, substituted, contained 154 articles, 91 of which related to crimes and their punishments; and the abolition of corporal punishment having been found to work very unsatisfactorily, it was, by this act, again introduced, but so greatly restricted that, even, a General Court Martial could only award 200 lashes, and these, only, for certain offences. Imprisonment with hard labor, which had become so common since 1839, was greatly restricted by this act, it being permitted to be awarded only for the most disgraceful crimes.

In 19 articles, death, or other punishment, could be awarded, the remaining articles admitting of imprisonment, simple or solitary, and with or without hard labor, and discharge.

The provisions in the Articles of War of Act XX.7th October,1845, may be said to be still in force, but, amended by the Act of 1st March, 1848, promulgating a new code, in which the principal alterations made, consisted in conferring increased power on commanding officers of regiments; making some articles more comprehensive; specifying some offences with more minuteness; changing, slightly, the mode of applying punishment, and providing for three crimes, viz.: striking or forcing a sentry; refusing to labor on field works, and a sentry plundering property under his charge; which were not detailed in former codes.

The code of 1st March, 1848, contains 158 articles, 96 of which specify crimes and their punishments, and, like that of 1845, by 19 of its articles, Military Courts can award the punishment of death. Corporal punishment may still be awarded, but it is, now, restricted to 50 lashes, and it is understood to be the wish of Government that it be awarded, only, for certain offences, viz.: mutiny; violence to superiors; insubordination; drunkenness on duty, and disgraceful conduct; and even, for such offences, to be as seldom as possible carried into effect.

In order to understand the frequency of dismissal and discharge in the Indian Army, it must also be mentioned that it has always been in the power of the Governor in Council and Commander-in-Chief,

to substitute dismissal from the service for the punishments which Courts Martial award. So that there are three modes by which men are removed from the service for crimes; some soldiers being discharged by sentence of Courts Martial; some, in consequence of having been sentenced by the Courts Martial, or by the Civil Courts of the country, to punishments, which, from their degrading nature, rendered those on whom they were inflicted, unworthy of remaining longer amongst soldiers; and some discharges are the punishments substituted or commuted by the superior authorities for those awarded by the Military Courts.

As the benefits and rewards of service should be commensurate with its punishments, to allow the latter to exert their fullest influence, and with the view of exhibiting the extent of the punishment inflicted by discharging a soldier, it may be mentioned that the pay of the Native Armies of India, particularly those of Bengal and Bombay, is greatly above the amount earned by their relatives or others of their own class of society, employed in the occupations of civil life. This is the case, even, when the soldier first enlists, and his pay is afterwards, at stated periods, increased. Besides this, every private soldier may obtain a commission, the Native officers of the regular army, Jemadars and Subadars, rising, exclusively, from the ranks. They also receive medals, when decreed to the army, and they are admitted into two military orders, viz.: the Order of Merit, with the title of Bāhādoor, into which the private equally with the commissioned officer may be admitted; and the Order of British India, with the title of Sirdar Bāhādoor, for Native officers of distinguished services. It will be observed from this that discharge from the service is a severe punishment and in this light the Native soldiers regard it.

The code of 1845, and that of 1848, are, both, more minute in their specification of crime, than the code of 1827; but from the nature of military service, and the closeness of the links in the chain of discipline, a soldier, committing himself, generally infringes more than one article, and when attempting, therefore, to classify the offences which led to the discharge of these 2,419 Madras Native soldiers, the graver crime has been the guide to the arrangement, as it doubtless had been to the sentence of the Court Martial.

It will be seen from the table that of the 91 articles providing for

crimes, in the code of the 7th October, 1845, it is only on 20 of them, or less than the fourth part, that the discharges have been awarded, viz. :

Mutiny,
Violence to superiors,
Disobedience of lawful command,
Desertion,
Drunkenness on duty,
Gross insubordination in the ranks, &c.
Breach of arrest or confinement,
False statement, &c. to obtain pension,
Malingering,
Selling or injuring Arms,
Embezzlement,
Disgraceful conduct,
Quitting or sleeping on post in time of peace,
Accepting bribes to procure leave, &c.
Quitting guard or picquet in time of peace,
Absence from parade,
Absence without leave or overstaying leave,
Absence from cantonment after hours,
Selling, losing, or wasting ammunition,
Crimes not specified (to the prejudice of good order,) &c. &c.

If it be established by further experience that these twenty classes of crime are of most frequent occurrence, the importance of directing considerable attention to their prevention or repression must be obvious.

Some of the above classes of crime were of more frequent occurrence than others, and it may be useful to allude to them individually : the first of them is

Mutiny. 37 Native soldiers are recorded to have been discharged for mutiny, in the five years, six of whom were Hindoos, and thirty-one Mahomedans ; in this period the average strength of the Madras native army was 44,129,* from which it appears that in the five years the number of discharged mutinous soldiers was, 8·3 in every 10,000 ; being, only, 1·6 per 10,000, annually.

It will be observed from the table that there were none discharged for mutiny in 1842-43 ; 1843-44 ; or in 1845-46 ; but that, of the 37 individuals, 31 were dismissed in 1844-45, and six in 1846-47, and those who combined appear to have been all Hindoos or all Mahomedans.

* See Appendix No. IV. In this strength is included only those soldiers whose names are inserted in the discharged rolls.

From this irregularity of its appearance, it may be inferred that causes of mutiny are either not in constant operation, or the Madras Native soldiers have not a mutinous disposition, but do occasionally band themselves together to obtain some specific object.

The Hindoos discharged for mutiny were on the average 26 years of age and had served 7½ years.

The average age of the Mahomedans was 31 years, and their service 14 years. The mutineers were, therefore, men of full growth, and above the average length of service: all of them, therefore, old soldiers, whose combinations must be regarded as a serious matter.

Violence to Superiors. Only six men are mentioned as having been discharged the service for this offence, 3 Hindoos, and 3 Mahomedans, most of them old soldiers, their average age being 25½ years, and their average service 7½ years.

Disobedience of Lawful Command, led to the discharge of 23 men, 16 of whom were Hindoos, 6 Mahomedans, and only 1 Christian.

The average age of the discharged men was upwards of 25 years, and their service 6 years, 8 months. This crime seems, therefore, to be an offence of the older soldiers.

Desertion. Of the 40 soldiers discharged for deserting, 31 were Hindoos, and nine Mahomedans. This is evidently an offence of very young soldiers, for their average age was only 21 years, and their service two years, and the Hindoos, the less military class of the Madras Presidency, have apparently deserted in somewhat greater numbers than the Mahomedans.

Drunkenness on Duty, has not often occurred, apparently, for only 7 cases of discharge are recorded from it, viz.: 5 Hindoos, 1 Mahomedan, and 1 Christian. This likewise seems to be a vice of the older soldiers, for the age of the offenders was, on the average 25 years, 5 months, and their average service six years, and one month.

Only one man was discharged for gross insubordination in the ranks, and two for breach of arrest.

False Statement or Certificate to obtain Pension, is a crime for which ten men are recorded to have been discharged. Their average age was twenty-four years and a half.

Malingering, led to the discharge of 13 men, 7 Hindoos and 6

Mahomedans, all of them of the older soldiers, their average age being 26 years, and service 7 years, 8 months.

Three men were discharged for selling or injuring arms, and one for embezzlement.

Disgraceful Conduct, led to the discharge of 127 Native soldiers, of whom 69 were Hindoos, 51 Mahomedans, and 7 Christians. Nearly the whole of this number, viz., 114, had committed theft; had robbed, or been found with stolen property in their possession. If we assume 28½ years, to be the average age, and 10 years the average service of the Madras Native army,* it would appear to be among the younger soldiers, that disgraceful conduct occurs, for the average age of all those discharged was 24 years, and their service five years.

Quitting or Sleeping on post in time of Peace, led to the discharge of 18 soldiers. All of them young men, their average age being 23 years 10 months, and service 5½ years.

Only 2 men accepted bribes and were discharged; 3 who quitted their guards, and 5 for absence from parade.

For Absence without Leave or Overstaying Leave, 42 discharges are mentioned, 23 Hindoos and 19 Mahomedans. Young men apparently commit these offences, for those discharged were on the average 23 years of age, and had served only 4 years and 8 months.

Only two discharges are mentioned under the head of absence from cantonment after hours, both of them being young Hindoo soldiers, and one Christian, of eight years' service, was discharged for wasting ammunition.

Crimes not specified, but, to the prejudice of good order and Military Discipline, led to the discharge of 320 soldiers, 151 of whom were Hindoos, 130 Mahomedans and 39 Christians. There are 80 offences enumerated as having been committed by these 320 soldiers, but the most frequent were insubordinate conduct for which 32 were dismissed; drunkenness, 55; incorrigible bad character, 90; and discovered to have been discharged from another regiment previously, 101; total 278, or six-sevenths of the whole of this class of crime. Only the younger soldiers appear to commit themselves in this manner, for the average age of all dismissed was only 22 years, 8 months, with 3 years and 10 months service.

* See Appendix No. II.

Physical Causes, have occasioned the discharge of 569 soldiers, of whom 327 were Hindoos, 172 Mahomedans, and 70 Christians. Part of these numbers had evidently, however, been discharged for diseases, which, from their nature, must have appeared in the course of the soldiers' service, and part of them, on account of constitutional defects, existing naturally in their constitution at the time of enlistment.

It will be useful, therefore, to examine the men discharged for Physical Causes, under these two heads :

I. *Number discharged on account of Disease.*

	215 Hindoos.		103 Mahomedans.		20 Christians.		338 Total.	
	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.
Whose average age at date of discharge, - - -	23	4	22	6	20	9	22	11
Whose average service at date of discharge, - -	4	6	4	2	4	2	4	5
*** Whose average age when entertained, - - -	18	10	18	4	16	7	18	6

The average age of all discharged for disease was about 23 years, and after 4½ years' service.

II. *Number discharged on account of Physical Defects.*

	112 Hindoos.		69 Mahomedans.		50 Christians.		231 Total.	
	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.
Whose average age at date of discharge, - - -	19	7	19	8	17	11	19	2
Whose average service at date of discharge, - - -	1	10	1	11	1	10	1	10
*** Whose average age when enlisted, - - - -	17	9	17	9	16	1	17	4

The greater number of the Christians were discharged from inability to learn music, but the Hindoos and Mahomedans were mostly discharged for imbecility, constitutional debility, and incapacity to

learn their drill. It will be observed that the soldiers discharged for these causes, were, only, 19 years of age, on the average, and had served only 1 year and 10 months.

The cause of the discharge of 1,077 soldiers, is not detailed. The omission is to be regretted, as it prevents us determining the exact numbers discharged for each crime, &c., but they seem to have been enlisted and again discharged at a like youthful age to that of the men, whose crimes and physical ailments are recorded.

Of the 1,077 thus discharged, viz.:

	579 Hindoos.		454 Mahomedans.		44 Christians.		1077 Total.	
	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.
Their average age at date of discharge, - - - -	23	10	24	0	24	3	23	11
Their average service at date of discharge, - - -	5	3	5	7	6	2	5	5
*** Their average age when enlisted, - - - -	18	7	18	5	18	1	18	6

these 1,077 soldiers were discharged before they were 24 years of age, after, only, 5½ years' service.

Only 110 soldiers, in five years, or five in ten thousand annually, received their discharge at their own request. They had served 5½ years, and were 24 years of age, on the average, at the date of their discharge.

Altogether 663 soldiers are recorded to have been discharged for crimes, viz.:

	337 Hindoos.		271 Mahomedans.		55 Christians.		663 Total.	
	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.	Yrs.	Ms.
Whose average age at date of discharge, - - - -	23	0	24	1	23	4	23	7
Whose average service at date of discharge, - - -	4	5	5	6	4	6	4	10
*** Their average age when enlisted, - - - -	18	7	18	7	18	10	18	9

It would, however, appear from these tables that some offences

are committed by the older men, and others, almost exclusively, by the younger part of the army.

Offences of the older Soldiers.

	Number Discharged.	Total. Ages. Ys.	Ms.	Services Ys.	Ms.
Mutiny, - - -	37	1118	0	479	4
Violence to superiors,	6	153	0	46	2
Disobedience of lawful command, - -	23	580	0	154	10
Drunkenness on duty	7	178	0	43	0
Gross insubordination in the ranks, or before a Court Martial, - - - -	1	26	0	8	8
Breach of arrest, or confinement, - -	2	56	0	21	3
Malingering, -	13	340	0	100	1
Wasting ammunition,	1	25	0	8	3
Total..	90	2476	0	861	7
Average..	0	27	6	9	6

Offences of the younger Soldiers.

	Number Discharged.	Total. Ages. Ys.	Ms.	Services Ys.	Ms.
Desertion, - -	40	844	0	81	4
False statement to obtain pension, -	10	246	0	43	2
Selling Arms, -	3	63	0	10	0
Embezzlement, -	1	23	0	2	10
Disgraceful conduct,	127	3068	0	668	10
Quitting or sleeping on post, &c. - -	18	430	0	101	5
Accepting bribes, -	2	48	0	9	7
Quitting guard or picquet in peace, -	3	80	0	22	7
Absence without leave, - - -	42	974	0	197	5
Absence from parade,	5	118	0	18	2
Absence from cantonment after hours,	2	43	0	9	0
Crimes to the prejudice of good order, &c. - - - -	320	7273	6	1227	1
Total..	573	13,210	6	2391	5
Average..	0	23	0	4	2

It would appear from this that the more grave military crimes are committed by the older soldiers, but that few of them do actually commit themselves, the number of them discharged being only 90 out of 663, or a seventh part of the whole of those dismissed for crimes.

The average age and service of all the 2,419 discharged men was as follows:

	1298 Hindoos. Yrs.	Ms.	942 Mahomedans. Yrs.	Ms.	179 Christians. Yrs.	Ms.	2419 Total. Yrs.	Ms.
Whose average age at date of discharge, - - - - -	23	4	23	6	21	9	23	3
Whose average service at date of discharge, - - -	4	7	5	1	4	4	4	9
*** Whose average age when entertained, - - - -	18	9	18	5	17	5	18	6

The average age of all the discharged men was only 23 years and 3 months, and their average service 4 years and 9 months; they had, therefore, been enlisted when only 18 years and 6 months old.

Military commanders, and Medical officers of armies have repeatedly objected to the entertainment of too young soldiers, and, in recent times, none have more strongly pointed out the inefficiency of this kind of troops, and the great value of old soldiers, than the Emperor Napoleon, and, His Grace the Duke of Wellington; and the same is strongly insisted on in the writings of M.M. Coche, Kirckhoff, and Inspector General Marshall. The chief objection which has hitherto been offered, however, has been the physical inability of young men to undergo the fatigues of field service, but we observe, from these tables, that there are grave objections to their enlistment, in a moral point of view; for, in the 5 years from 1842-43 to 1846-47, while 569 were discharged for disease and physical unfitness, whose average age was 21 years and 5 months, and their service 3 years and 4 months, 663 men were discharged for crimes, whose ages, only, average 23 years and 7 months, and their service 4 years and 10 months.

The diseased and physically unfit men, had been entertained when 18 years of age, and were discharged again at the age of 21: but the soldiers have been discharged for crimes at a somewhat later period of life, having been enlisted when 18 years and 9 months old, on the average, and discharged at the age of 23 years and 7 months, a difference of age at the time of their discharge of 2½ years.

The ages at which the greatest tendency to crime, and to disease occur amongst the native soldiers, may, however, be nearer each other than this, for, while sickly men come immediately under notice, (and the result of sickness being, generally, calculable, diseased or broken men are at once got rid of) moral sickness, *i. e.* the vices and crimes of young men being considered more obscure, a young soldier's first offences are gently dealt with, and his discharge is effected, only, after repeated admonitions and severer punishments have failed. And, therefore, although 21 years be the average age at which the native soldiers have been discharged for sickness, and

23 years the average age of those discharged for crimes, there may, probably, be a closer connection between mental and bodily sickness than these 2 years of difference would evince.

As the greater part of the crimes seem to have been committed by younger soldiers, and their crimes being of a nature which the thoughtlessness and excitability of youth, and their weakness in resisting temptation would lead them to commit, it might be a question, whether it would not be useful to keep the younger soldiers more constantly employed and thereby exhaust that nervous energy, the superabundance of which thrusts them into errors—to order, for instance, all soldiers under 5 years' service, to more frequent exercises than those above it.

But as the whole of the 2,419 soldiers had been entertained when only 18 years and 6 months old, and were discharged before the age of 24, there need be no hesitation in asserting that the greater number of them were enlisted and again discharged before ever they were physically fit for the fatigues of field service.

EDWARD BALFOUR,
Assistant Surgeon.

MADRAS, 1849.

For the 5 Years 1842-3, to 1846-7 inclusive.

ABSTRACT TABLE No. I. *Showing the number of Hindoos, Mahomedans and Christians of the Madras Native Army annually discharged the Service.*

CAUSES OF DISCHARGE.	1842-1843.				1843-1844.				1844-1845.				1845-1846.				1846-1847.				Total number in the 5 years from 1st September, 1842, to 31st August, 1847.			
	Hindoos.	Mahomedans.	Christians.	Total.	Hindoos.	Mahomedans.	Christians.	Total.	Hindoos.	Mahomedans.	Christians.	Total.	Hindoos.	Mahomedans.	Christians.	Total.	Hindoos.	Mahomedans.	Christians.	Total.	Hindoos.	Mahomedans.	Christians.	Total.
Mutiny,	0	0	0	0	0	0	0	0	4	27	0	31	0	0	0	0	2	4	0	6	6	31	0	37
Violence to Superiors,	1	0	0	1	0	0	0	0	1	0	0	1	0	1	0	1	1	2	0	3	3	3	0	6
Disobedience of Lawful Command,	2	2	0	4	3	1	0	4	1	2	0	3	5	0	1	6	5	1	0	6	16	6	1	23
Desertion,	13	3	0	16	10	1	0	11	0	2	0	2	1	1	0	2	7	2	0	9	31	9	0	40
Drunkenness on Duty,	1	1	0	2	1	0	0	1	0	0	0	0	0	0	0	0	3	0	1	4	5	1	1	7
Gross insubordination in the Ranks or before a Court Martial,	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
Breach of Arrest or Confinement,	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	2
False Statement or Certificate to obtain Pension,	0	0	1	1	2	1	0	3	0	0	0	0	0	0	0	0	4	2	0	6	6	3	1	10
Malingering,	1	0	0	1	3	2	0	5	0	2	0	2	2	1	0	3	1	1	0	2	7	6	0	13
Selling or injuring Arms, &c.	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	1	1	1	1	1	3
Embezzlement,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1
Disgraceful Conduct,	16	11	1	28	11	7	0	18	5	6	2	13	11	12	2	25	26	15	2	43	69	51	7	127
Quitting or sleeping on post in time of Peace,	2	0	0	2	2	0	0	2	1	0	0	1	3	2	0	5	3	4	1	8	11	6	1	18
Accepting Bribes to procure Leave, Promotion, &c.	1	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	2
Quitting Guard or Picquet in time of Peace,	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	2	1	0	3
Absence from Parade,	1	0	1	2	0	0	0	0	0	0	0	0	0	1	1	2	0	1	0	1	1	2	2	5
Absence without Leave or Overstaying Leave,	7	1	0	8	1	2	0	3	2	0	0	2	4	6	0	10	9	10	0	19	23	19	0	42
Absence from Cantonment after hours,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0	0	2
Wasting Ammunition, &c.	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Crimes not specified (to the prejudice of good order,) &c.	38	20	9	67	25	28	4	57	29	30	10	69	24	23	6	53	35	29	10	74	151	130	39	320
Disease,	73	42	5	120	30	12	1	43	31	12	2	45	45	17	7	69	36	20	5	61	215	103	20	338
Physical unfitness,	40	18	7	65	23	15	4	42	23	14	13	50	13	7	11	31	13	15	15	43	112	69	50	231
At his own request,	20	9	2	31	4	7	2	13	8	9	1	18	9	9	4	22	14	11	1	26	55	45	10	110
Crime or other cause of discharge not detailed,	103	92	6	201	160	140	12	312	174	130	10	314	62	38	9	109	80	54	7	141	579	454	44	1077
Total......	320	200	33	553	275	216	23	514	279	236	38	553	181	119	42	342	243	171	43	457	1298	942	179	2419

E. B.

For the 5 Years 1842-3, to 1846-7 inclusive.

Abstract Table No. II. *Constructed from the Monthly Discharge Rolls, of the Madras Native Army, showing the average Age, and average Service of all the Soldiers who were discharged, and the nature of the crimes or other causes which led to their discharge.*

1842-1843. Total Number of Years of Age and Years of Service.

Causes of Discharge	Hindoos Age Years	Hindoos Age Months	Hindoos Service Years	Hindoos Service Months	Mahomedans Age Years	Mahomedans Age Months	Mahomedans Service Years	Mahomedans Service Months	Christians Age Years	Christians Age Months	Christians Service Years	Christians Service Months	Total Age Years	Total Age Months	Total Service Years	Total Service Months
Mutiny	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Violence to Superiors	21	0	4	1	0	0	0	0	0	0	0	0	21	0	4	1
Disobedience of Lawful Command	43	0	3	4	45	0	9	8	0	0	0	0	88	0	13	0
Desertion	267	0	20	9	64	0	8	9	0	0	0	0	331	0	29	6
Drunkenness on Duty	26	0	6	10	21	0	3	1	0	0	0	0	47	0	9	11
Gross insubordination in the Ranks or before a Court Martial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Breach of Arrest or Confinement	20	0	1	11	0	0	0	0	0	0	0	0	20	0	1	11
False Statement or Certificate to obtain Pension	0	0	0	0	0	0	0	0	33	0	4	9	33	0	4	9
Malingering	22	0	4	3	0	0	0	0	0	0	0	0	22	0	4	3
Selling or injuring Arms, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Embezzlement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disgraceful Conduct	370	0	67	4	257	0	40	4	27	0	12	0	654	0	119	8
Quitting or Sleeping on post in time of Peace	53	0	13	2	0	0	0	0	0	0	0	0	53	0	13	2
Accepting Bribes to procure Leave, Promotion, &c.	23	0	3	10	0	0	0	0	0	0	0	0	23	0	3	10
Quitting Guard or Picquet in time of Peace	0	0	0	0	22	0	2	7	0	0	0	0	22	0	2	7
Absence from Parade	23	0	3	6	0	0	0	0	19	0	0	10	42	0	4	4
Absence without Leave or Overstaying Leave	146	0	17	1	19	0	0	7	0	0	0	0	165	0	17	8
Absence from Cantonment after hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wasting Ammunition, &c.	0	0	0	0	0	0	0	0	25	0	8	3	25	0	8	3
Crimes not specified, (to the prejudice of good order, &c.)	837	0	108	1	441	0	51	2	202	0	26	11	1480	0	186	2
Disease	1633	0	271	9	925	9	141	4	99	6	13	10	2658	3	426	11
Physical unfitness	767	0	44	10	378	0	44	1	133	0	14	8	1278	0	103	7
At his own request	493	0	116	2	207	0	43	5	44	0	13	9	744	0	173	4
Crime or other Cause of discharge not detailed	2300	0	397	4	2168	0	422	9	143	6	33	5	4611	6	853	6
Total	7044	0	1084	3	4547	9	767	9	726	0	128	5	12317	9	1969	5

1843-1844. Total Number of Years of Age and Years of Service.

Causes of Discharge	Hindoos Age Years	Hindoos Age Months	Hindoos Service Years	Hindoos Service Months	Mahomedans Age Years	Mahomedans Age Months	Mahomedans Service Years	Mahomedans Service Months	Christians Age Years	Christians Age Months	Christians Service Years	Christians Service Months	Total Age Years	Total Age Months	Total Service Years	Total Service Months
Mutiny	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Violence to Superiors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disobedience of Lawful Command	76	0	19	0	28	0	11	2	0	0	0	0	104	0	30	2
Desertion	198	0	8	6	25	0	6	11	0	0	0	0	223	0	15	5
Drunkenness on Duty	24	0	4	3	0	0	0	0	0	0	0	0	24	0	4	3
Gross insubordination in the Ranks or before a Court Martial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Breach of Arrest or Confinement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False Statement or Certificate to obtain Pension	48	0	13	8	23	0	5	9	0	0	0	0	71	0	19	5
Malingering	69	0	16	0	57	0	24	3	0	0	0	0	126	0	40	3
Selling or injuring Arms, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Embezzlement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disgraceful Conduct	276	0	72	1	167	0	43	10	0	0	0	0	443	0	115	11
Quitting or Sleeping on post in time of Peace	48	0	13	2	0	0	0	0	0	0	0	0	48	0	13	2
Accepting Bribes to procure Leave, Promotion, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quitting Guard or Picquet in time of Peace	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Absence from Parade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Absence without Leave or Overstaying Leave	24	0	3	6	49	0	8	4	0	0	0	0	73	0	11	10
Absence from Cantonment after hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wasting Ammunition, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crimes not specified, (to the prejudice of good order, &c.)	559	0	74	9	597	0	58	6	96	0	24	5	1252	0	157	8
Disease	688	0	138	0	270	0	39	11	22	0	3	6	980	0	181	5
Physical unfitness	433	0	41	7	313	0	27	9	75	0	8	5	821	0	77	9
At his own request	98	0	24	2	155	0	28	4	43	0	4	5	296	0	56	11
Crime or other Cause of discharge not detailed	3899	0	870	1	3274	9	704	8	273	6	55	7	7447	3	1630	4
Total	6440	0	1298	9	4958	9	959	5	509	6	96	4	11908	3	2354	6

1844-1845. Total Number of Years of Age and Years of Service.

Causes of Discharge	Hindoos Age Years	Hindoos Age Months	Hindoos Service Years	Hindoos Service Months	Mahomedans Age Years	Mahomedans Age Months	Mahomedans Service Years	Mahomedans Service Months	Christians Age Years	Christians Age Months	Christians Service Years	Christians Service Months	Total Age Years	Total Age Months	Total Service Years	Total Service Months
Mutiny	93	0	18	8	837	0	382	11	0	0	0	0	930	0	401	7
Violence to Superiors	24	0	5	7	0	0	0	0	0	0	0	0	24	0	5	7
Disobedience of Lawful Command	21	0	1	2	45	0	8	5	0	0	0	0	66	0	9	7
Desertion	0	0	0	0	38	0	1	8	0	0	0	0	38	0	1	8
Drunkenness on Duty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross insubordination in the Ranks or before a Court Martial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Breach of Arrest or Confinement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False Statement or Certificate to obtain Pension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malingering	0	0	0	0	58	0	16	3	0	0	0	0	58	0	16	3
Selling or injuring Arms, &c.	0	0	0	0	19	0	1	8	0	0	0	0	19	0	1	8
Embezzlement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disgraceful Conduct	130	0	35	5	126	0	21	11	41	0	5	7	297	0	62	11
Quitting or Sleeping on post in time of Peace	21	0	3	1	0	0	0	0	0	0	0	0	21	0	3	1
Accepting Bribes to procure Leave, Promotion, &c.	0	0	0	0	25	0	5	9	0	0	0	0	25	0	5	9
Quitting Guard or Picquet in time of Peace	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Absence from Parade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Absence without Leave or Overstaying Leave	43	0	8	7	0	0	0	0	0	0	0	0	43	0	8	7
Absence from Cantonment after hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wasting Ammunition, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crimes not specified, (to the prejudice of good order, &c.)	628	0	82	6	642	6	80	11	225	0	29	0	1495	6	192	5
Disease	711	0	130	11	256	0	48	7	40	0	10	10	1007	0	190	4
Physical unfitness	493	0	49	1	278	0	23	7	248	0	19	2	1019	0	91	10
At his own request	198	0	49	5	210	0	37	4	26	0	12	4	434	0	99	1
Crime or other Cause of discharge not detailed	4200	8	986	11	3153	8	773	6	247	6	71	9	7601	10	1832	2
Total	6562	8	1371	4	5688	2	1402	6	827	6	148	8	13078	4	2922	6

1845-1846. Total Number of Years of Age and Years of Service.

Causes of Discharge	Hindoos Age Years	Hindoos Age Months	Hindoos Service Years	Hindoos Service Months	Mahomedans Age Years	Mahomedans Age Months	Mahomedans Service Years	Mahomedans Service Months	Christians Age Years	Christians Age Months	Christians Service Years	Christians Service Months	Total Age Years	Total Age Months	Total Service Years	Total Service Months
Mutiny	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Violence to Superiors	0	0	0	0	33	0	15	7	0	0	0	0	33	0	15	7
Disobedience of Lawful Command	120	0	27	6	0	0	0	0	28	0	8	5	148	0	35	11
Desertion	22	0	0	5	20	0	0	8	0	0	0	0	42	0	1	1
Drunkenness on Duty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross insubordination in the Ranks or before a Court Martial	0	0	0	0	26	0	8	8	0	0	0	0	26	0	8	8
Breach of Arrest or Confinement	0	0	0	0	0	0	0	0	36	0	19	4	36	0	19	4
False Statement or Certificate to obtain Pension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malingering	54	0	12	8	35	0	20	1	0	0	0	0	89	0	32	9
Selling or injuring Arms, &c.	23	0	3	11	0	0	0	0	0	0	0	0	23	0	3	11
Embezzlement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disgraceful Conduct	264	0	54	2	293	0	78	8	48	0	10	5	605	0	143	3
Quitting or Sleeping on post in time of Peace	69	0	15	10	57	0	17	10	0	0	0	0	126	0	33	8
Accepting Bribes to procure Leave, Promotion, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quitting Guard or Picquet in time of Peace	24	0	3	9	0	0	0	0	0	0	0	0	24	0	3	9
Absence from Parade	0	0	0	0	26	0	3	8	25	0	2	11	51	0	6	7
Absence without Leave or Overstaying Leave	95	0	23	5	152	0	38	3	0	0	0	0	247	0	61	8
Absence from Cantonment after hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wasting Ammunition, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crimes not specified, (to the prejudice of good order, &c.)	562	0	90	6	531	0	93	5	155	0	51	2	1248	0	235	1
Disease	1110	0	237	10	395	0	79	8	155	0	39	7	1660	0	357	1
Physical unfitness	232	0	36	8	118	0	10	9	175	0	22	7	525	0	70	0
At his own request	224	0	56	1	211	0	50	0	93	0	16	3	528	0	122	4
Crime or other Cause of discharge not detailed	1440	0	313	11	907	0	243	5	225	0	60	11	2572	0	617	11
Total	4239	0	876	4	2804	0	660	8	940	0	231	7	7983	0	1768	7

1846-1847. Total Number of Years of Age and Years of Service.

Causes of Discharge	Hindoos Age Years	Hindoos Age Months	Hindoos Service Years	Hindoos Service Months	Mahomedans Age Years	Mahomedans Age Months	Mahomedans Service Years	Mahomedans Service Months	Christians Age Years	Christians Age Months	Christians Service Years	Christians Service Months	Total Age Years	Total Age Months	Total Service Years	Total Service Months
Mutiny	63	0	26	8	125	0	51	1	0	0	0	0	188	0	77	9
Violence to Superiors	26	0	8	10	49	0	12	1	0	0	0	0	75	0	20	11
Disobedience of Lawful Command	151	0	61	0	23	0	5	2	0	0	0	0	174	0	66	2
Desertion	167	0	30	5	43	0	3	3	0	0	0	0	210	0	33	8
Drunkenness on Duty	79	0	20	8	0	0	0	0	28	0	8	2	107	0	28	10
Gross insubordination in the Ranks or before a Court Martial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Breach of Arrest or Confinement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False Statement or Certificate to obtain Pension	90	0	4	1	52	0	14	11	0	0	0	0	142	0	19	0
Malingering	25	0	4	10	20	0	1	9	0	0	0	0	45	0	6	7
Selling or injuring Arms, &c.	0	0	0	0	0	0	0	0	21	0	4	5	21	0	4	5
Embezzlement	23	0	2	10	0	0	0	0	0	0	0	0	23	0	2	10
Disgraceful Conduct	661	0	149	0	364	0	75	5	44	0	2	8	1069	0	227	1
Quitting or Sleeping on post in time of Peace	69	0	18	2	93	0	18	2	20	0	2	0	182	0	38	4
Accepting Bribes to procure Leave, Promotion, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quitting Guard or Picquet in time of Peace	34	0	16	3	0	0	0	0	0	0	0	0	34	0	16	3
Absence from Parade	0	0	0	0	25	0	7	3	0	0	0	0	25	0	7	3
Absence without Leave or Overstaying Leave	202	0	36	3	244	0	61	5	0	0	0	0	446	0	97	8
Absence from Cantonment after hours	43	0	9	0	0	0	0	0	0	0	0	0	43	0	9	0
Wasting Ammunition, &c.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crimes not specified, (to the prejudice of good order, &c.)	866	0	213	11	719	0	184	0	213	0	57	10	1798	0	455	9
Disease	878	0	201	7	476	0	123	5	99	0	16	4	1453	0	341	4
Physical unfitness	271	0	34	6	272	0	16	9	267	0	30	5	810	0	81	8
At his own request	352	0	89	3	274	0	73	7	22	0	1	3	648	0	164	1
Crime or other Cause of discharge not detailed	2005	0	490	11	1406	0	395	2	179	0	53	1	3590	0	939	2
Total	6005	0	1418	2	4185	0	1043	5	893	0	176	2	11083	0	2637	9

Aggregate of Ages and Services for the 5 Years from 1st August 1842, to 31st July 1847.

Causes of Discharge	Hindoos Age Years	Hindoos Age Months	Hindoos Service Years	Hindoos Service Months	Mahomedans Age Years	Mahomedans Age Months	Mahomedans Service Years	Mahomedans Service Months	Christians Age Years	Christians Age Months	Christians Service Years	Christians Service Months	Total Age Years	Total Age Months	Total Service Years	Total Service Months
Mutiny	156	0	45	4	962	0	434	0	0	0	0	0	1118	0	479	4
Violence to Superiors	71	0	18	6	82	0	27	8	0	0	0	0	153	0	46	2
Disobedience of Lawful Command	411	0	112	0	141	0	34	5	28	0	8	5	580	0	154	10
Desertion	654	0	60	1	190	0	21	3	0	0	0	0	844	0	81	4
Drunkenness on Duty	129	0	31	9	21	0	3	1	28	0	8	2	178	0	43	0
Gross insubordination in the Ranks or before a Court Martial	0	0	0	0	26	0	8	8	0	0	0	0	26	0	8	8
Breach of Arrest or Confinement	20	0	1	11	0	0	0	0	36	0	19	4	56	0	21	3
False Statement or Certificate to obtain Pension	138	0	17	9	75	0	20	8	33	0	4	9	246	0	43	2
Malingering	170	0	37	9	170	0	62	4	0	0	0	0	340	0	100	1
Selling or injuring Arms, &c.	23	0	3	11	19	0	1	8	21	0	4	5	63	0	10	0
Embezzlement	23	0	2	10	0	0	0	0	0	0	0	0	23	0	2	10
Disgraceful Conduct	1701	0	378	0	1207	0	260	2	160	0	30	8	3068	0	668	10
Quitting or Sleeping on post in time of Peace	260	0	63	5	150	0	36	0	20	0	2	0	430	0	101	5
Accepting Bribes to procure Leave, Promotion, &c.	23	0	3	10	25	0	5	9	0	0	0	0	48	0	9	7
Quitting Guard or Picquet in time of Peace	58	0	20	0	22	0	2	7	0	0	0	0	80	0	22	7
Absence from Parade	23	0	3	6	51	0	10	11	44	0	3	9	118	0	18	2
Absence without Leave or Overstaying Leave	510	0	88	10	464	0	108	7	0	0	0	0	974	0	197	5
Absence from Cantonment after hours	43	0	9	0	0	0	0	0	0	0	0	0	43	0	9	0
Wasting Ammunition, &c.	0	0	0	0	0	0	0	0	25	0	8	3	25	0	8	3
Crimes not specified, (to the prejudice of good order, &c.)	3452	0	569	9	2930	6	468	0	891	0	189	4	7273	6	1227	1
Disease	5020	0	980	1	2322	9	432	11	415	6	84	1	7758	3	1497	1
Physical unfitness	2196	0	206	8	1359	0	122	11	898	0	95	3	4453	0	424	10
At his own request	1365	0	335	1	1057	0	232	8	228	0	48	0	2650	0	615	9
Crime or other Cause of discharge not detailed	13844	8	3058	10	10909	5	2539	6	1068	6	274	9	25822	7	5873	1
Total	30290	8	6048	10	22183	8	4833	9	3895	0	781	2	56370	4	11663	9

Average Age and Average Service of the Soldiers discharged the Service.

Causes of Discharge	Hindoos Age Years	Hindoos Age Months	Hindoos Service Years	Hindoos Service Months	Mahomedans Age Years	Mahomedans Age Months	Mahomedans Service Years	Mahomedans Service Months	Christians Age Years	Christians Age Months	Christians Service Years	Christians Service Months	Total Age Years	Total Age Months	Total Service Years	Total Service Months
Mutiny	26	0	7	6	31	0	14	0	0	0	0	0	30	2	12	11
Violence to Superiors	23	8	6	2	27	4	9	2	0	0	0	0	25	6	7	8
Disobedience of Lawful Command	25	8	7	0	23	6	5	8	28	0	8	5	25	2	6	8
Desertion	21	1	2	11	21	1	2	4	0	0	0	0	21	1	2	0
Drunkenness on Duty	25	9	6	4	21	0	3	1	28	0	8	2	25	5	6	1
Gross insubordination in the Ranks or before a Court Martial	0	0	0	0	26	0	8	8	0	0	0	0	26	0	8	8
Breach of Arrest or Confinement	20	0	1	11	0	0	0	0	36	0	19	4	28	0	10	7
False Statement or Certificate to obtain Pension	23	0	2	11	25	0	6	10	33	0	4	9	24	7	4	3
Malingering	24	3	5	4	28	4	10	4	0	0	0	0	26	1	7	8
Selling or injuring Arms, &c.	23	0	3	11	19	0	1	8	21	0	4	5	21	0	3	4
Embezzlement	23	0	2	10	0	0	0	0	0	0	0	0	23	0	2	10
Disgraceful Conduct	24	7	5	5	23	8	5	1	22	10	4	4	24	1	5	1
Quitting or Sleeping on post in time of Peace	23	7	5	8	25	0	6	0	20	0	2	0	23	10	5	7
Accepting Bribes to procure Leave, Promotion, &c.	23	0	3	10	25	0	5	9	0	0	0	0	24	0	4	9
Quitting Guard or Picquet in time of Peace	29	0	10	0	22	0	2	7	0	0	0	0	26	8	7	6
Absence from Parade	23	0	3	6	25	6	5	5	22	0	1	10	23	7	3	7
Absence without Leave or Overstaying Leave	22	2	3	10	24	5	5	8	0	0	0	0	23	2	4	8
Absence from Cantonment after hours	21	6	4	6	0	0	0	0	0	0	0	0	21	6	4	6
Wasting Ammunition, &c.	0	0	0	0	0	0	0	0	25	0	8	3	25	0	8	3
Crimes not specified, (to the prejudice of good order, &c.)	22	10	3	9	22	6	3	7	22	10	4	10	22	8	3	10
Disease	23	4	4	6	22	6	4	2	20	9	4	2	22	11	4	5
Physical unfitness	19	7	1	10	19	8	1	11	17	11	1	10	19	2	1	10
At his own request	24	9	6	1	23	5	5	2	22	9	4	9	24	1	5	7
Crime or other Cause of discharge not detailed	23	10	5	3	24	0	5	7	24	3	6	2	23	11	5	5
Total	23	4	4	7	23	6	5	1	21	9	4	4	23	3	4	9

E. B.

Appendix No. I. *Showing, as per Madras Medical Board's Records, the strength of the Madras Native Army, included in the Medical Returns.*

	Years.	Annual Average Strength.
	1843	74,618
	1844	73,763
	1845	73,577
	1846	74,861
	1847	74,682
Aggregate strength,...	....	371,501
Average strength,...	....	74,300

Appendix No. II. *Showing the average Age of the 5th Regiment M. N. I. on the 1st January,* 1848.

Number of each Class.	Designation.	Total Ages. Years.	Average Ages. Years.	Average Ages. Months.
20	Native Commissioned Officers,..	892	44	7
15	Musicians (Indo Britons,)... ...	367	24	0
8	Drummers, (do. do.)...	200	25	0
9	Fifers, (do. do.)...	220	24	6
2	Buglers, (do. do.)......... ...	61	30	6
13	Lascars, (Natives,).........	397	30	6
796	Fighting Men, (Native Hindoos, Mahomedans, and Christians,).........	22,958	28	10
Total...868		25,095	28	11

Appendix No. III. *Castes of the Madras Native Army, vide Col.* Sykes, *on Vital Statistics, p.* 11.

1837-38.			1838-39.			1839-40.		
Mahomedans.	Other Castes.	Total.	Mahomedans.	Other Castes.	Total.	Mahomedans.	Other Castes.	Total.
18,965	23,190	42,155	19,700	25,231	44,931	20,779	28,741	49,520

E. B.

Appendix No. IV. *Showing the average Strength of the Madras Native Army, including all the Natives whose names appear in the Rolls of Discharged Men. From the Office of the Adjutant General of the Madras Army.*

Years.	Number of Hindoos.	Number of Mahomedans.	Number of Christians.	Total Number of all Castes.
1842	27,271	19,447	1,908	48,626
1843	20,710	13,935	1,455	36,100
1844	21,781	14,589	1,693	38,063
1845	29,071	18,346	2,471	49,888
1846	27,223	18,252	2,497	47,972
1847	25,764	17,408	2,476	45,648
1848	18,441	13,470	2,125	34,036
Aggregate strength...	170,261	115,447	14,625	300,333
Average strength of the 7 years, - -	24,323	16,492	2,089	42,904

E. B.

VII. Proceedings of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 1*st August*, 1848, *at* 7 *o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Major P. ANSTRUTHER, C. B.
Lieut. Colonel O. FELIX,
Sir H. C. MONTGOMERY, Bart.
J. OUCHTERLONY, Esq.
T. PYCROFT, Esq.
R. H. WILLIAMSON, Esq., and
Captain J. J. LOSH, *Secretary.*

Read draft of revised rules, prepared and circulated since the last monthly Meeting, in conformity with the 1st Resolution thereat.

I. *Resolved,*—That these revised rules be approved, and that 250 copies of them be printed as soon as possible for distribution to Subscribers; also that the rules for the 3rd class subscribers be published in the *Fort Saint George Gazette*, and that the Librarian be instructed to ascertain what would be the charge for publishing them in the principal newspapers at the Presidency.

The following Rules have been established for the guidance of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

1. The Society is designated the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

2. The Members of the Society consist of two classes, viz.:

Members of the first class, paying a donation of 35 Rupees, and a quarterly subscription of 22 Rupees, who receive in circulation all new Publications, Magazines, &c., and enjoy all the other privileges of the Society.

Members of the second class, paying a donation of 15 Rupees, and a quarterly subscription of 10 Rupees, who are entitled to the use of the museum and the perusal of all stock books in the Library, upon their application for the same.

3. Persons desirous of becoming Members may be admitted to either class at their option on application to the Secretary, accompanied by the recommendation of one Member of the Society in the following form:

I recommend Mr. ———— to be a Member of the Madras Literary Society and Auxiliary of the Royal Asiatic Society of the —— class.

4. The Officers belonging to the garrison of Madras, and other persons not permanently stationed or resident at the Presidency, may become Members of the Society, and be entitled to all the privileges of Members of the 2nd class, without paying donation.

5. The quarters are considered as commencing on the 1st of January, April, July, and October, respectively—a new Member admitted in the first month of the quarter is required to pay the whole subscription, in the second month two-thirds, and in the third month, one-third of the subscription for the current quarter. Members absent from the Presidency on duty or otherwise are exempted from subscription.

6. The management of the affairs of the Society is vested in eleven Members, severally chosen at the Annual General Meeting of the Society, who, together with the Secretary, form the General Committee of Management.

7. The General Committee of Management elect their own Chairman, who is ex-officio a Member of all Sub-Committees.

8. The Secretary is appointed by the General Committee of Management, subject to the approval of the President of the Society.

9. All vacancies, permanent or temporary, in the Committee of Management, occurring in the course of the current year, may be filled up by the Committee.

10. Any Member of the Committee of Management who, without satisfactory reason assigned, absents himself from three successive monthly Meetings of the Committee, is held thereby to have ceased to belong to the Committee, which will proceed accordingly to supply his place, in accordance with Rule 9.

11. The whole of the funds of the Society are subject to the control of the General Committee of Management, and all donations and subscriptions form one fund, to be appropriated for the general purposes of the Society.

12. The duties formerly conducted by the Committee of papers of the Asiatic department are now entrusted to a Sub-Committee elected from the Members of the General Committee of Management.

13. A General Meeting of the Society is held annually, as soon as possible after the Society's accounts for the preceding year have been closed and passed by the managing Committee, and statements of them prepared for submission to the General Meeting.

14. Under the 3rd and 4th Resolutions passed by the Anniversary Meeting of the Royal Asiatic Society, held on the 14th March, 1829, Members of both classes of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, while residing in Asia, are non-resident Members of the Royal Asiatic Society, and when in Europe may be elected resident Members, in the same manner that honorary Members are elected; and Members of the Royal Asiatic Society while residing in Europe are non-resident Members of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, but when within the Presidency of Madras may be elected resident Members, in the manner prescribed by the regulations of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

Rules for the Library of the Society, applicable to Members of the Society subscribing in the 1st and 2nd classes.

1. The Library is open to all Members of the Society, who are entitled to the use of the stock books, and of the new publications as they are received from England, subject to the rules and regulations hereafter prescribed.

2. A catalogue of the books in the Library is printed when necessary, for the use of the resident Members.

3. Any person who may lose or seriously injure a book is required to pay for the whole work, at the price marked in the catalogue kept at the Library.

4. On the arrival of new books from England, a printed list of them is furnished to each Member of the first class, the day on which the circulation is to commence being notified thereon.

5. Any such Members desirous of reading any of the books in the list, is to send a note to that effect to the Librarian, not later than the day previous to the day of circulation.

6. The time limited for the reading of all new books is determined by the Secretary, according to the nature of the work, and is marked on the cover, and each Member is to return the book at the expiration of the limited time, to the Library, when it will be forwarded to the person whose name is next on the list and so on in rotation.

7. The names of persons who are irregular in returning books to the Library at the expiration of the time allowed for their perusal are to be reported by the Librarian to the Committee, and their names put at the bottom of the lists at the discretion of the latter.

8. Reviews and Magazines are, immediately on their arrival, to be sent in circulation to Members of the first class, who are disposed into divisions, according to residence and to the number of copies received.

9. The Librarian keeps a register to enter the application of Members for books, which are accordingly furnished immediately, if in the Library; but if the books applied for be in circulation, or in use by other Members, they are to be forwarded to the persons applying, when returned to the Library at the expiration of the time limited for the perusal of them.

10. With regard to the stock books of the Library, the following periods are allowed for their detention by the Members, viz., six days for a Duodecimo volume, ten days for an Octavo, sixteen days for a Quarto, and twenty-four days for a Folio, at the expiration of which time if any other Member has applied for the book, it is to be returned or re-called; but if no other Member has applied for it, the book may be allowed to remain a further time with the person reading it.

11. No Member is allowed to take more than two works from the Library at the same time, except on countersignature of a Member of the Managing Committee; and this rule is to be strictly and peremptorily enforced.

12. No manuscripts belonging to the Society can be taken out of the Library without the especial permission of the Managing Committee.

13. All stock books issued from the Library are requested to be returned on the 1st January, and the 1st of July, in each year, and are not to be demanded for three days afterwards to admit of their being compared with the catalogue.

Rules for the Library of the Society, applicable to Subscribers of the 3rd Class.

At the annual General Meeting held on the 27th March, 1848, it was proposed "that steps be taken to render the Society's Library more available than it has hitherto been to the public at large, by throwing it open to a third class of subscribers, each of whom will be allowed to carry out a single work at a time on lodging a small deposit with the Librarian, on terms similar to those observed in the public Libraries at Calcutta and the Cape of Good Hope," which proposition was approved of, and the Committee of management were authorised to adopt measures for carrying it into effect. In pursuance of the above resolution, the following Rules have been established, and have effect from the 1st October, 1848.

3rd Class.

The use of a portion of the stock books of the Library shall be open to persons not Members of the Society on the following conditions:

1. The third class of subscribers consists of persons subscribing one Rupee per mensem each. A subscriber of the third class may take out of the Library any of the works available to that class, if not comprising more than three (or if a novel more than five) volumes. Of other works not more than two volumes can be taken out at one time.

2. Every subscriber of the 3rd class before receiving books from the Library is required to lodge a deposit of 20 Rupees with the Librarian, one half in cash and the residue by a promissory note, and such deposit shall be applicable to the discharge of all claims by the Society upon such subscriber.

3. Applications for books must be made by subscribers in person or by written orders signed by such subscribers, and sent by a person provided with a bag or box for the conveyance and security of the books, which shall also be returned with similar precaution.

4. Subscribers of the 3rd class are allowed to keep books for the following periods:

Octavo volumes,	- - - - -	a week,
Quarto do.	- - - - -	2 weeks,
Folio do.	- - - - -	3 weeks.

Exclusive of the day of delivery.

5. On the expiration of the above periods the books must be returned to the Library by the party who took them, in failure of which he shall be subject, at the discretion of the Committee, to a fine not exceeding one anna a day, chargeable on his deposit for the time of detention in excess of the regulated period.

6. Any 3rd class subscriber failing to return a book within three months is required to provide another complete copy of the work, for which his deposit will be held responsible.

7. The return of any book in a damaged state is to be reported to the Committee, who shall determine the penalty to be exacted.

8. Any subscriber taking out a book in a damaged state, and not giving notice of the same to the Librarian, shall be held accountable for it.

9. Any subscriber lending a book taken out by him shall incur a fine to be fixed by the Committee.

10. Notice shall be given to any subscriber of any fine or penalty incurred by him, and the amount, if not paid, shall be deducted from his deposit, and no book issued to him until the deposit be again completed.

11. Subscriptions must be paid monthly to the Librarian by the parties themselves. No books will be issued to subscribers in arrears.

12. Subscribers desiring to withdraw shall receive back their deposit by and under an order of the Committee.

Memo.

At General Bishop's sale I bought for 106 Rupees a very fine copy of Rees's Cyclopedia, capitally bound and quite as good as new.

I offer it to the Literary Society for the same price which is less than half its London price at present.

(Signed) C. P. Brown,
28*th July*, 1848.

Mr. Brown sends Mr. Bantleman 3 volumes of Rees's and wishes them to be laid before the Meeting on Tuesday.

Saturday, 29*th July*.

They should be kept in this box.

Read Memoranda from C. P. Brown, Esq., offering to the Literary Society for the same price at which he purchased it, viz., 106 Rupees, a copy of Rees's Cyclopedia, and sending 3 volumes of the work to be laid before the Meeting.

II. *Resolved*,—That Mr. Brown be thanked for his offer; which however, in consideration of the present state of the funds of the Society, and the number of similar works already in the Library, the Committee feel themselves under the necessity of declining.

Read letter from the Chief Secretary to Government, transmitting, by order of Government, one copy of a work for determining the time, recently published at the Presidency.

Fort St. George, 6*th July*, 1848.

No. 48.

Public Department.

Gentlemen,

I am directed by the Right Honorable the Governor in Council to transmit to you one copy of a work for determining the time, just published at the Presidency.

I have the honor to be,

Gentlemen,

Your most obedient Servant,

(Signed) J. F. Thomas,

Chief Secretary.

To

The Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

The work in question, and also the* transactions of the Bombay Geographical Society from January 1847 to April 1848, and† Nos. 5 and 6 of volume 2d, and Supplement to No. 6 of volume 1st of the Journal of the Indian Archipelago and Eastern Asia, presented to the Society since the last Meeting, are laid before the Meeting.

* Presented by the Bombay Geographical Society.

† Presented by J. R. Logan, Esq., Singapore.

III. *Resolved,*—That these publications be deposited in the Library.

Read letter from Messrs. Wm. H. Allen and Co., dated 19th June, 1848, advising the despatch of periodicals and of books per Steamer, and stating that they have been obliged to subscribe to the Hakluyt Society for the purpose of obtaining a copy of Hawkins's South Sea Voyages, and requesting to be informed if the subscription is to be continued.

IV. *Resolved,*—That the receipt of this letter be acknowledged, and that Messrs. Allen and Co. be requested to continue to subscribe to the Hakluyt Society on account of the Madras Literary Society. Also that the receipt of the books and periodicals in question be acknowledged, as soon as it is ascertained that they have arrived, and that the following works be ordered out for the use of the Society :

The Fairfax Correspondence.

Japan and Japanese, post octavo.

Histoire des Cagots on races proscrits en France and Espagne, par M. Michel.

Physical Atlas of Natural Phenomena, by A. K. Johnston, F. R. G. S.

Analogies and Contrasts or Comparative Sketches of France and England, by the author of "Recollections of Russia."

Resolved, further,—At the suggestion of Major Anstruther, C. B., that copies of two translations by Major Begbie, of the Madras Artillery, recently published at the Presidency, be purchased on account of the Society, and, at the suggestion of Walter Elliot, Esq., that a copy of Bird on the Jains and Buddhists, published at Bombay, be obtained by the first opportunity.

(Signed) WALTER ELLIOT, *Chairman.*

(Signed) J. J. LOSH, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 5th September, 1848, *at 7 o'clock* P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Major R. GARSTIN,
W. A. MOREHEAD, Esq.
Lieut. Col. T. S. PRATT, C. B.
T. PYCROFT, Esq.
R. H. WILLIAMSON, Esq. and

Captain J. J. LOSH, *Secretary.*

Read note, to the address of the Secretary, from Surgeon MacGregor, H. M. 25th Regiment, enclosing a notice respecting a work offered for sale to the Society.

MADRAS, 29*th August*, 1848.

SIR,

The accompanying notice of a work for sale was sent me by Lieut. Halsted, Cannanore, for submission through you to the Madras Literary Society. I shall feel obliged by your laying the matter before the Committee.

Your's very faithfully,
(Signed) J. MACGREGOR,
Surgeon 25th Regiment.

FOR SALE AT CANNANORE.

Plans, Elevations, Sections and Details of the Moorish palace at Grenada in Spain called " Alhambra," as taken by M. Jules Goury and Owen Jones, Architects, a magnificent architectural work, super-extra bound in green morocco and gilt edges, royal folio, two volumes in one, ...Rs. 300

I. *Resolved*,—That Surgeon MacGregor be informed that the Managing Committee, while thankful for the offer of the valuable work in question, are precluded from accepting it in consequence of the present condition of the funds of the Society.

MEMO.

The 9th volume of Strickland's Lives of the Queens of England has been lost by J. H. Wilkins, Esq.

Blackwood's Magazine, vol. 50, and Love and Pride, a Novel in 3 vols., taken from the Library by Lieut. H. H. Pratt, H. M. 94th Regiment, have not been returned. The former he said was by mistake taken on to Cannanore and that it would be returned.

Robison's History of Free Masonry, taken from the Library by Captain Seale, H. M. 94th Regiment, has not been returned.

Read Memorandum from the Librarian respecting certain books belonging to the Library which have been lost or not returned by Subscribers.

II. *Resolved*,—That, unless the books in question are returned to the Library before the next monthly Meeting of the Committee, the parties concerned be called upon either to replace or pay for them in conformity with the rules.

Read letters from Messrs. William H. Allen and Co., dated 27th June and 19th July, 1848, the former advising the despatch of books, &c., per *Barham*, and the latter of books and periodicals per Steamer.

III. *Resolved*,—That the receipt of Messrs. Allen and Co.'s letters be acknowledged, and that they be requested to send out the following books for the use of the Society.

The Isle of Man: its History, &c. &c., by the Rev. J. G. Cumming, M. A. F. G. S.

Captain de la Graviere's Sketches of the last Naval War, translated by the Hon. Captain Plunkett, R. N., 2 vols.

Supplement to Burke's History of the Landed Gentry of England, Scotland, and Ireland.

Hand Book of Painting in Spain, by Sir T. Head.

Quatremore de Quinecy's Histoire de Michael Angel Buonarotti.

Do. do. Histoire de la vie et des Ouvres de Raphael d'Urbino.

The Life of Leonardo du Vinci, London. 1828.

Vasaris' History of the Early Painters, Sculptors and Architects, (English Translation.)

MEMO.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following gentlemen since the monthly Meeting of the Committee held on the 6th June, 1848.

R. Alexander, Esq., No. 31...	2	0	0
Chungra Warrier, Esq., 2 copies Nos. 30 and 31............	8	0	0
Messrs. Pharoah and Co., Nos. 30 and 31..................	4	0	0
Rupees...	14	0	0

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a memorandum of the sums received on account of subscriptions to Nos. 30 and 31 of the Society's Journal since the Meeting of the 6th June, 1848, is laid on the table.

IV. *Resolved*,—That this Memorandum be recorded.

With reference to the 1st Resolution at the last monthly Meeting, the Committee are of opinion that it will not be necessary to publish the rules for the 3d class subscribers in any newspaper except the *Fort St. George Gazette.*

V. *Resolved,*—That the Editors of the *Spectator*, *Athenæum*, *Crescent*, *United Service Gazette*, and *Circulator* be each furnished with a copy of the revised rules of the Society, with an intimation that the rules for the 3d class of Subscribers are entirely new.

(Signed) WALTER ELLIOT, *Chairman.* (Signed) J. J. LOSH, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 3d October, 1848, *at* 7 *o'clock*, P. M.

PRESENT.

Chairman.

WALTER ELLIOT, Esq.

Members.

Major P. ANSTRUTHER, C. B.
Lieut. Colonel O. FELIX,
Major R. GARSTIN,
J. OUCHTERLONY, Esq.
T. PYCROFT, Esq.
R. H. WILLIAMSON, Esq., and
Captain J. J. LOSH, *Secretary.*

Read letter from the Secretary to the Board of Revenue in the Department of Public Works, dated 21st September, 1848, No. 729, forwarding copy of a letter which the Board propose to address to Government upon the subject of the formation of a central Museum of Economic Geology at the Presidency should the other public bodies with whom they have been directed to act in concert, concur therein.

DEPARTMENT OF PUBLIC WORKS.
MADRAS, 21*st September*, 1848.
No. 729.

From Captain J. H. BELL,
Secretary to the Board of Revenue in the Department of Public Works.

To the Secretary to the Literary Society.

SIR,

I am directed by the Board of Revenue, with reference to the order
August 4th 1846, No. 726. of Government upon the subject of the formation of a central Museum of Economic Geology at the Presi-

dency, to forward copy of a letter which they propose to submit to Government, should the other public bodies with whom they have been directed to act in concert concur therein.

The Board therefore request you will be pleased to inform them of the sentiments of the Literary Society on the subject.

I have the honor to be,

Sir,

Your most obedient Servant,

(Signed) J. H. Bell,

Secretary Board of Revenue Dep. P. W.

To the Secretary to the Literary Society.

To the Chief Secretary to Government.

Sir,

I am directed by the Board of Revenue with reference to the order of Government as per margin, to observe that they have since been favored with a copy of the letter addressed to Government by the Managing Committee of the Madras Literary Society upon the subject of the proposed central Museum.

August 4th, 1846. No. 726. November 16th, 1846.

In the propositions generally of the Literary Society the Board concur, and they now consider it necessary again to solicit the attention of Government to the subject, and to recommend that early measures may be taken for the provision of a suitable building and a qualified Curator for the Museum, which would doubtless, if once thus established under skilful management, be filled with objects necessary for the study of the sciences and useful arts.

I have, &c.

(Signed) J. H. Bell,

Secy. Board of Revenue D. P. W.

(True copy.)

(Signed) J. H. Bell,

Secy. Board of Revenue D. P. W.

I. *Resolved*,—That the Revenue Board be informed, in reply, that the Managing Committee approve of, and fully concur in the application which the Board propose to submit to Government.

Read letter from the Librarian Calcutta Public Library acknowledging the receipt of certain numbers of the Madras Journal of Literature,

and returning the best acknowledgments of the Curators of the above institution to the Madras Literary Society for the donation.

To the Secretary to the Madras Literary Society.

SIR,

I beg to acknowledge your letter under date the 30th June last, advising of the transmission per "*Precursor*" of a parcel containing Nos. 2 to 5 of the Madras Journal of Literature, which have come to hand. I have also been favored with No. 33 of the publication in question, and for these kind acts on the part of the Society I beg you will be good enough to convey to it the best acknowledgments of the Curators of this institution.

I have the honor to be, &c. &c.

(Signed) PEARY CHAND MITTRA, *Librarian, Calcutta Public Library.*

METCALFE HALL,
1*st September*, 1848.

II. *Resolved*,—That this letter be recorded.

Read Memorandum from C. P. Brown, Esq., forwarding a printed list of books offered for sale and recommending the Society to purchase one complete set.

III. *Resolved*,—That it does not appear advisable to purchase duplicates of works already in the Library, and that therefore the Librarian be requested to mark such works as the Society is already provided with in the list, after which the Committee will consider if it be expedient to purchase the others, or any of them.

Read letters from two Subscribers respecting works belonging to the Library which have not been returned by them and for which they are willing to pay.

11*th September*, 1848.

Mr. McTaggart regrets to inform Mr. Bantleman that Corinne on Italy, by Made. de Stael, has been taken out of his house by some guest and that consequently he must pay the cost of the work.

19*th September*, 1848.

Lieut. Colonel Forster begs to acknowledge the Librarian's note, relative to Drury's Poems, &c. &c.

Lieut. Colonel Forster perfectly recollects the book in question being amongst others at his house, and he certainly thought it had been returned especially with reference to the period which has elapsed since it was with him.

If however the Librarian is *quite certain* that the book was not returned or in usual course sent to other Subscribers, *then* Lieut. Colonel Forster will be prepared to pay the value of it, as he regrets that after a diligent search it is no where to be found.

IV. *Resolved,*—That W. McTaggart, Esq., and Lieut. Colonel Forster be called upon to pay for the works in question.

Read letter from Messrs. Wm. H. Allen and Co., dated 19th August, 1848, advising the despatch of periodicals and books per Steamer.

V. *Resolved,*—That the receipt of Messrs. Allen and Co.'s letter, and of the periodicals and books alluded to, be acknowledged, and that they be requested to send out the following books for the use of the Society.

Collection of Treaties and Engagements with Native Princes and States of Asia, published in 1812.
Memoirs and Correspondence of Viscount Castlereagh, second Marquis of Londonderry, 4 vols.
} To be sent out by Steamer.

Resolved, further,—That Messrs. Allen and Co. be reminded that they have not yet sent out "Marsden's Travels of Marco Polo," which work was ordered in the beginning of 1844, and is still required, and that they be directed to discontinue sending out Ainsworth's and Hood's Magazines and the Christian Observer, and informed that one of the numbers of the United Service Journal for June, 1848, sent out by them is incomplete, pages 193 to 208 being missing, and other superfluous pages inserted instead.

Read Memorandum from Major P. Anstruther, C. B.

I think Colonel Pratt says we ought to have Jomini, Traitè des Grandes Operations Militaires, 11 vols. If so the Society may have a copy, (I have two)—at a valuation.

(Signed) P. Anstruther.

VI. *Resolved,*—That Major Anstruther be requested to send the copy of the work in question which he is willing to dispose of for the inspection of the Managing Committee at their next monthly Meeting, with a memorandum showing the price at which it is valued by him.

In conformity with the 7th Resolution at the Meeting on the 8th December, 1846, a Memorandum of the sums received on account of subscriptions to Nos. 30 and 31 of the Society's Jour-

Memo.

Subscriptions to the Journal Nos. 30 and 31 have been received from the following Gentlemen since the monthly Meeting of the Committee held on the 5th September, 1848.

R. D. Parker, Esq., Nos. 30 and 31, Rupees 4-0-0.

nal since the Meeting of the 5th September, 1848, is laid on the table.

VII. *Resolved*,—That this Memorandum be recorded.

(Signed) Walter Elliot, *Chairman.* (Signed) J. J. Losh, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday the 7th November, 1848, *at* 7 *o'clock* P. M.

Present.

Chairman.

Walter Elliot, Esq.

Members.

Lieut. Colonel O. Felix,
Sir H. C. Montgomery, Bart.
J. Ouchterlony, Esq.
Lieut. Colonel T. S. Pratt, c. b.
R. H. Williamson, Esq., and
Captain J. J. Losh, *Secretary.*

The Secretary having brought to the notice of the Meeting that there are still much difficulty and delay in collecting sums due on account of the Society's Journal from Subscribers at out-stations, and that the arrangement which it was expected would be effected for making the collections in question by the aid of the Post Office Writers has not been found practicable ; at the suggestion of the Chairman, it is

I. *Resolved*,—That a letter, as per margin, be addressed to Government, and in the event of a favorable answer being received, that the bills for each number of the Journal be put up and transmitted with the publication itself; each bill being prepared in the name of the nearest Collector or Military Paymaster, to whom the Secretary will, at the same time

To the Chief Secretary to Government.

Sir,

I have the honor, by desire of the Committee of Management of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, to request you will do them the favor to ascertain whether there will be any objection on the part of the Government to authorize Collectors and Paymasters at the several out-stations to receive and transmit the payments on account of the Madras Journal of Literature and Science, due by Subscribers in the interior. The trifling cost of each number of that publication renders the collection of so many small sums in the ordinary manner a matter of great difficulty, and as the Government have been pleased to extend a large measure of their patronage to the Journal and to authorize the publication in it of papers connected with the public records, the Committee trust that it may not be considered in-

expedient to permit the same arrangement to be extended to its Subscriptions as exists with regard to the Government Gazette.

address a communication by letter containing a list of the claims so referred to him.

With reference to the 3d Resolution at the last monthly Meeting, the Committee proceed to take into consideration the expediency of making purchases of the books included in the printed list forwarded by Mr. C. P. Brown with his Memo. dated 11th September last.

II. *Resolved,*—That it is inexpedient to purchase the works in question particularly as it appears that many of them are already in the Library.

Read letter from Captain T. J. Newbold, offering to the Society specimens of Rocks and Fossils.

To the Secretary Madras Branch Royal Asiatic Society.

SIR;

I do myself the pleasure of offering to the Society the accompanying specimens of the Rocks and Fossils of the Chikuldap Hills in H. H. the Nizam's territories.

I have the honor to be,
Sir,
Your most obedient Servant,
(Signed) T. J. NEWBOLD,
Captain 23d M. Light Infantry.

III. *Resolved,*—That the specimens of Rocks and Fossils be accepted and deposited in the Museum, and that the best thanks of the Committee on behalf of the Society, be offered to Captain Newbold for his valuable present.

MEMORANDUM
For circulation to the Literary Society Committee.

More than three years have elapsed since I presented to Government my Library of Manuscripts in Sanscrit, Telugu and other languages.

These books were deposited by me in the Madras College Library and there they still remain. To this day I have received no document from Government acknowledging the gift.

The books have been placed under the charge of the Literary Society. The event has proved me correct in thinking this injudicious. The collection ought to have been placed under the care of the College Board, unless a separate Curator should be appointed. At present no individual is answerable for the books, and were I once out of the way the entire collection would

Read Memorandum from C. P. Brown, Esq.

* The Committee observe that when, by Extract from Minutes of Consultation in the Public Department, dated 5th February, 1847, No. 124, Government permitted the collections of Native books and manuscripts in charge of the Literary Society to be transferred to the College Board, the proposed arrangement was postponed at the particular request of Mr. Brown himself.

IV. *Resolved,*—That as soon as the examination and classification of the books

be at the mercy of any Native who thought it worth while to bribe the Librarians who are common Native scribes.

I wish this memorandum to appear in the next number of the Journal, to show the uselessness of attaching this manuscript collection to the Literary Society, and to suggest the necessity of placing the manuscripts in charge of some responsible person.

(Signed) C. P. Brown.

Madras, 7*th Oct.* 1848.

and manuscripts in question now in progress is completed, the subject of Mr. Brown's Memorandum be again taken into consideration.

Memorandum.

Without returning the under-mentioned works belonging to the Society's Library, R. S. Ellis, Esq., went home by the last Steamer on the 15th October, 1848.

The Crescent and the Cross, 2 vols.
The Fallacies of the Faculty.

Read Memorandum from the Librarian respecting certain works not returned to the Library by Mr. R. S. Ellis, who has proceeded to England.

V. *Resolved*,—That, on his return to India, Mr. Ellis be called upon to pay for the works in question, should they not be returned to the Library in the mean time.

Mr. Bantleman,

I send the book I offered to sell, I think it is worth 40 Rupees, as I see it is 15 volumes besides the Atlas.

If the Society purchases it, be so good as give me credit for the amount as I am in arrears.

Your's, &c.

(Signed) P. Anstruther.

24*th Oct.* 1848.

Memo.

Arrears of subscription due by Major P. Anstruther, C. B., to the Society are Rupees 64 0 0

Read Memorandum from Major P. Anstruther, C. B., offering, with reference to the 6th Resolution at the last monthly Meeting, for sale to the Society, a copy of Jomini's Traité des Grandes Operations Militaire, in 15 volumes, with a large Atlas, for 40 Rupees.

VI. *Resolved*,—That the work in question be purchased for the Society, and that, in compliance with Major Anstruther's request, the price of it be placed to his credit in part payment of arrears of subscription due by him.

Fort St. George, 18*th Oct.* 1848.

No. 946.

Public Department.

Gentlemen,

With reference to Para. 2 of Extract from Minutes of Consultation, dated 5th February last, No. 129, I am directed by the Right Honorable the Governor in Council to request to be furnished, at an early date, with the quarterly reports required by the Honorable Court, of the number of Oriental manuscripts now in your charge, which have been examined and classed.

I have the honor to be, &c. &c.

(Signed) J. F. Thomas,
Chief Secretary.

To

The Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society.

Read letter from the Chief Secretary to Government requesting to be furnished with the quarterly reports required by the Honorable the Court of Directors of the number of Oriental manuscripts in charge of the Society which have been examined and classified, letter from the Chairman of the Committee reporting progress, and draft of letter from the Secretary forwarding a copy of the letter for the information of Government, all of which have been circulated since the last Meeting.

VII. *Resolved,*—That this subject does not require further consideration at present.

From WALTER ELLIOT, *Esq.*

To Captain LOSH,

Secretary to the Literary Society.

SIR,

I beg to inform you, with reference to the letter of the Chief Secretary to Government in the Public Department, No. 946, dated 18th Instant, in which the Committee of the Literary Society are requested to furnish the quarterly reports required by the Honorable the Court of Directors of the number of Oriental MSS. in charge of the Society which have been examined and classified, that it has not, up to this time, been found possible to procure the services of an adequately qualified Superintendent, as proposed in the report of the Sub-Committee, dated 5th June, 1846. But in order that the wishes of the Honorable Court might not be altogether disappointed, I have myself, as my time permitted, conducted an examination and analysis of the MSS., the results of which are exhibited in the following tabular statement:

	Number of MSS.			Of which Abstracted and Classified.			Remain.		
	Cadjan	Paper	Total.	Cadjan	Paper	Total.	Cadjan	Paper	Total.
Sanscrit, ...	805	534	1,339	765	37	802	40	497	537
Telugu,.......	712	452	1,164	243	0	243	469	452	921
Canarese,......	0	22	22	0	0	0	0	22	22
Tamil,..........	14	0	14	0	0	0	14	0	14
Malayalem,...	3	0	3	0	0	0	3	0	3
Burma,........	21	0	21	0	0	0	21	0	21
Total...	1,555	1,008	2,563	1,008	37	1,045	547	971	1,518

I may add that this has been accomplished without incurring any extra expense, by means of my establishment as Canarese Translator to Government, and with the occasional aid of such of the College Moonshees as happened from time to time, to be unemployed by the Junior Civil Servants studying in the Institution. The progress of the examination has necessarily, under such circumstances, been slow; but

considerable progress has been made, and the whole may be expected to be completed at no distant period.

I have the honor to be, &c. &c.

(Signed) WALTER ELLIOT,
Chairman Lit. Socy. Committee.

FORT ST. GEORGE,
26*th October*, 1848.

To Captain LOSH,
Secretary to the Literary Society.

To The Chief Secretary to Government,
Fort St. George.

SIR,

1. I have the honor, by desire of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, to acknowledge the receipt of your letter* to their address, dated 18th Instant, No. 946, and, in advertence to the subject thereof, to annex for the information of the Right Honorable the Governor in Council copy of a letter* from their Chairman, from which it will be perceived that they have not yet been able to effect the arrangement sanctioned by the Honorable the Court of Directors in the 2d paragraph of their letter* to Government, dated 21st December, 1847, in supersession of that made under the† authority of the Government of India, dated 19th July, 1845, which latter, consequently, remains undisturbed.

2. The Committee propose, on the completion of the examination and classification of the manuscripts to submit a full and detailed report respecting them, for the information of the Right Honorable the Governor in Council, and the Honorable the Court of Directors.

I have the honor to be, &c. &c.

(Signed) J. J. LOSH,
Secretary M. L S. &c.

LITERARY SOCIETY, COLLEGE,
31*st October*, 1848.

* Public Department.

* Dated 26th October, 1848.

* Recorded in Extract from the Minutes of Consultation in the Public Department, 5th February, 1848, No. 129.

† Letter from the Secretary to the Government of India, No. 490, recorded in Extract from Minutes of Consultation in the Public Department, dated 15th August, 1845, No. 737.

Read letters from Messrs. Wm. H. Allen and Co., dated 8th and 19th September, 1848, the former admitting the despatch of books per *Devonshire* and the latter of books and periodicals per Steamer.

VIII. *Resolved,*—That the receipt of Messrs. Allen and Co.'s letters be acknowledged, and that they be requested to send out the following books for the use of the Society.

To be sent out by Steamer:

- History of England from the Accession of James II., by T. B. Macaulay.
- Translation of the Book of Enoch, by Laurence.
- The History of the Dodo, by Strickland.
- An Account of the Ionic Trophy Monument from Xanthus, by Sir C. Fellowes.
- Presbytery Examined, by the Duke of Argyll.
- Dog Breaking, by Lieut. Col. W. N. Hutchinson.
- Pictures from the North, by G. F. Atkinson, Esq., Bengal Engineers.
- Affection, its Flowers and Fruits, a Tale of the Times.
- Field Sports in the United States and British Provinces of America, by Frank Forester.
- The Two Baronesses, by H. C. Anderson.

(Signed) Walter Elliot, *Chairman.*

(Signed) J. J. Losh, *Secretary M. L. S. &c.*

At a Meeting of the Managing Committee of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the Club House, on Tuesday, the 5th December, 1848, at 7 o'clock P. M.

Present.

Chairman.

Walter Elliot, Esq.

Members.

C. P. Brown, Esq.
Sir H. C. Montgomery, Bart.
W. A. Morehead, Esq.
J. Ouchterlony, Esq.
T. Pycroft, Esq.
R. H. Williamson, Esq., and
Captain J. J. Losh, *Secretary.*

The Secretary reports that there are now funds sufficient to discharge the bill of the Superintendent of the Christian Knowledge Society's Press for printing the 33rd Number of the Society's Journal.

I. *Resolved,*—That the Superintendent of the Christian Knowledge Society's Press be informed that his bill, amounting to Rupees 487-9-7

will be paid when presented for payment in the course of the present month.

Read letter from Messrs. William H. Allen and Co. dated 19th October, 1848, advising the despatch of periodicals and books per Steamer.

II. *Resolved*,—That the receipt of Messrs. Allen and Co.'s letter, and of the periodicals and books alluded to be acknowledged, and that they be requested to send out the following books for the use of the Society.

Smith's Dictionary of Greek and Roman Antiquities.
The Jesuit Conspiracy. The secret plan of the order detected and revealed, by the Abbate Leone.
Six Weeks in Corsica, by W. Carnin, Esq.
Travels in Sardinia, by J. W. W. Tyndale, M. A.
Vicissitudes of the Eternal City, by J. Whiteside, A. M.
A Campaign in New Mexico with Colonel Doniphan, by F. S. Edwards, a Volunteer.
(Pamphlet) Letter to the Marquis of Lansdowne, by Lord Brougham.
Charles de Montford, a French Novel printed about 1805.
Cumberland's Novels: namely, Arundal, Henry, and John de Lancaster.
The Reformation and Anti-Reformation in Bohemia, (English Translation.

} To be sent out by Steamer.

(Signed) Walter Elliot, *Chairman.* (Signed) J. J. Losh, *Secretary M. L. S. &c.*